Practice: 102 - Comprehensive Nutrient Management Plan - Written

Scenario: #3 - Non-Dairy Operation Greater Than or Equal to 300 AU and Less Than 700 AU with Land Application

Scenario Description:

A Comprehensive Nutrient Management Plan (CNMP) will be developed to address resource concerns on a medium non-dairy Animal Feeding Operation (AFO) currently greater than or equal to 300 and less than 700 animal units (AU).--primarily swine, poultry, and beef AFOs. The producer may export (material transferred to another owner with written documentation of the transfer) modest amounts of the manure or organic products from the farm. For operations where manure is both applied to land the AFO owner/operator controls and exported offsite, guidance to determine appropriate CNMP CAP scenario selection shall be provided by NRCS at the state level. The producer has an animal production area, farms cropland, and applies most nutrients. The CNMP is a conservation plan that addresses resource concerns on the AFO production area and land application areas. Production area components of the plan must include animal confinement facilities, feeding and lounging lots, animal mortality facilities, and manure containment and storage facilities. Land application components of the plan must include all lands under the control of the AFO owner or operator where waste materials are being applied. Planned practices on the production area and land application areas must result in meeting NRCS quality criteria for water quality and soil erosion. Any applicable air emission and negative air quality impacts occurring as a result of planned CNMP activities, or existing on-farm activities must be mitigated in the CNMP if feasible. The CNMP meets the AFO owner/operator's production objectives.

Before Situation:

The owner/operator of a medium sized non-dairy AFO has not received a written Comprehensive Nutrient Management Plan (CNMP) that addresses all resource concerns present on the facility production area and land waste application areas. Various levels of management and conservation implementation have occurred on the farm. Little documentation of the systems used and practices installed exists. The producer may or may not have a conservation plan or a nutrient management plan. Partial implementation of CNMP-related practices for the AFO has potentially occurred. Resource concerns on the AFO production area and land waste application areas remain to be addressed through the development of a complete CNMP including management and conservation practices for proper manure/wastewater storage and handling, proper disposal of animal mortality, treatment of land application areas to reduce soil erosion to sustainable levels, and application of waste nutrients at an agronomic rate that meets application crop needs and does not exceed site risk analysis assessment condition. Negative air quality impacts and farmstead safety and security issues may remain on the AFO, and recordkeeping methods for crop yields, inspection and monitoring of the existing CNMP-related practices, and manure application and imports/exports may need further improvement.

After Situation:

A certified Technical Services Provider (TSP) has delivered, to the AFO owner/operator, a comprehensive nutrient management plan meeting CNMP CAP criteria (GM - Part 405 - Comprehensive Nutrient Management Plans), and to NRCS with the CNMP Case File data that describes management and conservation practice solutions to all identified resource concerns on the non-dairy AFO production area and land application areas. Collection, transfer, and storage of manure and wastewater systems, mortality management facilities, as well as any rainfall or runoff diversion systems will be inventoried/evaluated and planned for adequacy according to applicable NRCS conservation practice standard technical criteria by a Professional Engineer. Management and conservation practices in the CNMP document delivered to the client ensure that, if implemented, the AFO will properly, within applicable NRCS standards and specifications, store, handle, and contain manure and wastewater materials generated by the AFO; dispose of AFO mortality; implement conservation practices to reduce soil erosion on land application areas to sustainable levels; land apply waste material nutrients in a manner than meets NRCS 590 Nutrient Management standard technical criteria. Decisions presented within the CNMP have been made to mitigate, if feasible, negative air quality impacts and improve farmland safety and security. Practices selected in the Record of Decision will provide estimated quantities to be installed in units of measure that align with the practice standards. Accurate recordkeeping documents for crop yields, operation and maintenance of existing and new CNMP-related practices, manure application, AFO manure imports and exports, and other information relevant to the management and compliance of the AFO with state and/or local rules and regulations are included in the CNMP. If the CNMP is not implemented all identified resource concerns will still exist.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $11,715.12

Scenario Cost/Unit: $11,715.12

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$103.58	72	$7,457.76
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$78.84	54	$4,257.36

Practice: 102 - Comprehensive Nutrient Management Plan - Written

Scenario: #107 - Non-Dairy Operation Less Than 300 AU with Land Application

Scenario Description:

A Comprehensive Nutrient Management Plan (CNMP) will be developed to address resource concerns on a small non-dairy Animal Feeding Operation (AFO) currently less than 300 animal units (AU)--primarily swine, poultry, and beef AFOs. The producer may export (material transferred to another owner with written documentation of the transfer) modest amounts of the manure or organic products from the farm. For operations where manure is both applied to land the AFO owner/operator controls and exported offsite, guidance to determine appropriate CNMP CAP scenario selection shall be provided by NRCS at the state level. The producer has an animal production area, farms cropland, and applies most nutrients. The CNMP is a conservation plan that addresses resource concerns on the AFO production area and land application areas. Production area components of the plan must include animal confinement facilities, feeding and lounging lots, animal mortality facilities, and manure containment and storage facilities. Land application components of the plan must include all lands under the control of the AFO owner or operator where waste materials are being applied. Planned practices on the production area and land application areas must result in meeting NRCS quality criteria for water quality and soil erosion. Any applicable air emission and negative air quality impacts occurring as a result of planned CNMP activities, or existing on-farm activities must be mitigated in the CNMP if feasible. The CNMP meets the AFO owner/operator's production objectives.

Before Situation:

The owner/operator of a small sized non-dairy AFO has not received a written Comprehensive Nutrient Management Plan (CNMP) that addresses all resource concerns present on the facility production area and land waste application areas. Various levels of management and conservation implementation have occurred on the farm. Little documentation of the systems used and practices installed exists. The producer may or may not have a conservation plan or a nutrient management plan. Partial implementation of CNMP-related practices for the AFO has potentially occurred. Resource concerns on the AFO production area and land waste application areas remain to be addressed through the development of a complete CNMP including management and conservation practices for proper manure/wastewater storage and handling, proper disposal of animal mortality, treatment of land application areas to reduce soil erosion to sustainable levels, and application of waste nutrients at an agronomic rate that meets application crop needs and does not exceed site risk analysis assessment condition. Negative air quality impacts and farmstead safety and security issues may remain on the AFO, and recordkeeping methods for crop yields, inspection and monitoring of the existing CNMP-related practices, and manure application and imports/exports may need further improvement.

After Situation:

A certified Technical Services Provider (TSP) has delivered, to the AFO owner/operator, a comprehensive nutrient management plan meeting CNMP CAP criteria (GM - Part 405 - Comprehensive Nutrient Management Plans), and to NRCS the CNMP Case File data that describes management and conservation practice solutions to all identified resource concerns on the small-sized non-dairy AFO production area and land application areas. Collection, transfer, and storage of manure and wastewater systems, mortality management facilities, as well as any rainfall or runoff diversion systems will be inventoried/evaluated and planned for adequacy according to applicable NRCS conservation practice standard technical criteria by a Professional Engineer. Management and conservation practices in the CNMP document delivered to the client ensure that, if implemented, the AFO will properly, within applicable NRCS standards and specifications, store, handle, and contain manure and wastewater materials generated by the AFO; dispose of AFO mortality; implement conservation practices to reduce soil erosion on land application areas to sustainable levels; land apply waste material nutrients in a manner than meets NRCS 590 Nutrient Management standard technical criteria. Decisions presented within the CNMP have been made to mitigate, if feasible, negative air quality impacts and improve farmland safety and security. Practices selected in the Record of Decision will provide estimated quantities to be installed in units of measure that align with the practice standards. Accurate recordkeeping documents for crop yields, operation and maintenance of existing and new CNMP-related practices, manure application, AFO manure imports and exports, and other information relevant to the management and compliance of the AFO with state and/or local rules and regulations are included in the CNMP. If the CNMP is not implemented all identified resource concerns will still exist.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $9,087.02

Scenario Cost/Unit: $9,087.02

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$103.58	55	$5,696.90
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$78.84	43	$3,390.12

Practice: 102 - Comprehensive Nutrient Management Plan - Written

Scenario: #110 - Dairy Operation Greater Than or Equal to 300 AU and Less Than 700 AU with Land Application

Scenario Description:

A Comprehensive Nutrient Management Plan (CNMP) will be developed to address resource concerns on a medium Dairy Animal Feeding Operation (AFO) currently greater than or equal to 300 and less than 700 animal units (AU). The producer may export (material transferred to another owner with written documentation of the transfer) modest amounts of the manure or organic products from the farm. For operations where manure is both applied to land the AFO owner/operator controls and exported offsite, guidance to determine appropriate CNMP CAP scenario selection shall be provided by NRCS at the state level. The producer has an animal production area, farms cropland, and applies most nutrients. The CNMP is a conservation plan that addresses resource concerns on the AFO production area and land application areas. Production area components of the plan must include animal confinement facilities, feeding and lounging lots, animal mortality facilities, and manure containment and storage facilities. Land application components of the plan must include all lands under the control of the AFO owner or operator where waste materials are being applied. Planned practices on the production area and land application areas must result in meeting NRCS quality criteria for water quality and soil erosion. Any applicable air emission and negative air quality impacts occurring as a result of planned CNMP activities, or existing on-farm activities must be mitigated in the CNMP if feasible. The CNMP meets the AFO owner/operator's production objectives.

Before Situation:

The owner/operator of a medium sized Dairy AFO has not received a written Comprehensive Nutrient Management Plan (CNMP) that addresses all resource concerns present on the facility production area and land waste application areas. Various levels of management and conservation implementation have occurred on the farm. Little documentation of the systems used and practices installed exists. The producer may or may not have a conservation plan or a nutrient management plan. Partial implementation of CNMP-related practices for the AFO has potentially occurred. Resource concerns on the AFO production area and land waste application areas remain to be addressed through the development of a complete CNMP including management and conservation practices for proper manure/wastewater storage and handling, proper disposal of animal mortality, treatment of land application areas to reduce soil erosion to sustainable levels, and application of waste nutrients at an agronomic rate that meets application crop needs and does not exceed site risk analysis assessment condition. Negative air quality impacts and farmstead safety and security issues may remain on the AFO, and recordkeeping methods for crop yields, inspection and monitoring of the existing CNMP-related practices, and manure application and imports/exports may need further improvement.

After Situation:

A certified Technical Services Provider (TSP) has delivered, to the AFO owner/operator, a comprehensive nutrient management plan meeting CNMP CAP criteria (GM - Part 405 - Comprehensive Nutrient Management Plans), and to NRCS the CNMP with Case File data that describes management and conservation practice solutions to all identified resource concerns on the dairy AFO production area and land application areas. Collection, transfer, and storage of manure and wastewater systems, mortality management facilities, as well as any rainfall or runoff diversion systems will be inventoried-evaluated and planned for adequacy according to applicable NRCS conservation practice standard technical criteria by a Professional Engineer. Management and conservation practices in the CNMP document delivered to the client ensure that, if implemented, the AFO will properly, within applicable NRCS standards and specifications, store, handle, and contain manure and wastewater materials generated by the AFO; dispose of AFO mortality; implement conservation practices to reduce soil erosion on land application areas to sustainable levels; land apply waste material nutrients in a manner than meets NRCS 590 Nutrient Management standard technical criteria. Decisions presented within the CNMP have been made to mitigate, if feasible, negative air quality impacts and improve farmland safety and security. Practices selected in the Record of Decision will provide estimated quantities to be installed in units of measure that align with the practice standards. Accurate recordkeeping documents for crop yields, operation and maintenance of existing and new CNMP-related practices, manure application, AFO manure imports and exports, and other information relevant to the management and compliance of the AFO with state and/or local rules and regulations are included in the CNMP. If the CNMP is not implemented all identified resource concerns will still exist.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $12,987.44

Scenario Cost/Unit: $12,987.44

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$103.58	82	$8,493.56
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$78.84	57	$4,493.88

Practice: 102 - Comprehensive Nutrient Management Plan - Written

Scenario: #111 - Non-Dairy Operation Greater Than or Equal to 700 AU with Land Application

Scenario Description:

A Comprehensive Nutrient Management Plan (CNMP) will be developed to address resource concerns on a large non-dairy Animal Feeding Operation ((AFO) currently greater than or equal to 700 animal units (AU)--primarily swine, poultry, and beef AFOs. The producer may export (material transferred to another owner with written documentation of the transfer) modest amounts of the manure or organic products from the farm. For operations where manure is both applied to land the AFO owner/operator controls and exported offsite, guidance to determine appropriate CNMP CAP scenario selection shall be provided by NRCS at the state level. The producer has an animal production area, farms cropland, and applies most nutrients. The CNMP is a conservation plan that addresses resource concerns on the AFO production area and land application areas. Production area components of the plan must include animal confinement facilities, feeding and lounging lots, animal mortality facilities, and manure containment and storage facilities. Land application components of the plan must include all lands under the control of the AFO owner or operator where waste materials are being applied. Planned practices on the production area and land application areas must result in meeting NRCS quality criteria for water quality and soil erosion. Any applicable air emission and negative air quality impacts occurring as a result of planned CNMP activities, or existing on-farm activities must be mitigated in the CNMP if feasible. The CNMP meets the AFO owner/operator's production objectives.

Before Situation:

The owner/operator of a large sized non-dairy AFO has not received a written Comprehensive Nutrient Management Plan (CNMP) that addresses all resource concerns present on the facility production area and land waste application areas. Various levels of management and conservation implementation have occurred on the farm. Little documentation of the systems used and practices installed exists. The producer may or may not have a conservation plan or a nutrient management plan. Partial implementation of CNMP-related practices for the AFO has potentially occurred. Resource concerns on the AFO production area and land waste application areas remain to be addressed through the development of a complete CNMP including management and conservation practices for proper manure/wastewater storage and handling, proper disposal of animal mortality, treatment of land application areas to reduce soil erosion to sustainable levels, and application of waste nutrients at an agronomic rate that meets application crop needs and does not exceed site risk analysis assessment condition. Negative air quality impacts and farmstead safety and security issues may remain on the AFO, and recordkeeping methods for crop yields, inspection and monitoring of the existing CNMP-related practices, and manure application and imports/exports may need further improvement.

After Situation:

A certified Technical Services Provider (TSP) has delivered, to the AFO owner/operator, a comprehensive nutrient management plan meeting CNMP CAP criteria (GM - Part 405 - Comprehensive Nutrient Management Plans), and to NRCS the CNMP Case File data that describes management and conservation practice solutions to all identified resource concerns on the non-dairy AFO production area and land application areas. Collection, transfer, and storage of manure and wastewater systems, mortality management facilities, as well as any rainfall or runoff diversion systems will be inventoried/evaluated and planned for adequacy according to applicable NRCS conservation practice standard technical criteria by a Professional Engineer. Management and conservation practices in the CNMP document delivered to the client ensure that, if implemented, the AFO will properly, within applicable NRCS standards and specifications, store, handle, and contain manure and wastewater materials generated by the AFO; dispose of AFO mortality; implement conservation practices to reduce soil erosion on land application areas to sustainable levels; land apply waste material nutrients in a manner than meets NRCS 590 Nutrient Management standard technical criteria. Decisions presented within the CNMP have been made to mitigate, if feasible, negative air quality impacts and improve farmland safety and security. Practices selected in the Record of Decision will provide estimated quantities to be installed in units of measure that align with the practice standards. Accurate recordkeeping documents for crop yields, operation and maintenance of existing and new CNMP-related practices, manure application, AFO manure imports and exports, and other information relevant to the management and compliance of the AFO with state and/or local rules and regulations are included in the CNMP. If the CNMP is not implemented all identified resource concerns will still exist.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $14,160.80

Scenario Cost/Unit: $14,160.80

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$103.58	88	$9,115.04
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$78.84	64	$5,045.76

Practice: 102 - Comprehensive Nutrient Management Plan - Written

Scenario: #112 - Dairy Operation Greater Than or Equal to 700 AU with Land Application

Scenario Description:

A Comprehensive Nutrient Management Plan (CNMP) will be developed to address resource concerns on a large Dairy Animal Feeding Operation (AFO) currently greater than or equal to 700 animal units (AU). The producer may export (material transferred to another owner with written documentation of the transfer) modest amounts of the manure or organic products from the farm. For operations where manure is both applied to land the AFO owner/operator controls and exported offsite, guidance to determine appropriate CNMP CAP scenario selection shall be provided by NRCS at the state level. The producer has an animal production area, farms cropland, and applies most nutrients. The CNMP is a conservation plan that addresses resource concerns on the AFO production area and land application areas. Production area components of the plan must include animal confinement facilities, feeding and lounging lots, animal mortality facilities, and manure containment and storage facilities. Land application components of the plan must include all lands under the control of the AFO owner or operator where waste materials are being applied. Planned practices on the production area and land application areas must result in meeting NRCS quality criteria for water quality and soil erosion. Any applicable air emission and negative air quality impacts occurring as a result of planned CNMP activities, or existing on-farm activities must be mitigated in the CNMP if feasible. The CNMP meets the AFO owner/operator's production objectives.

Before Situation:

The owner/operator of a large sized Dairy AFO has not received a written Comprehensive Nutrient Management Plan (CNMP) that addresses all resource concerns present on the facility production area and land waste application areas. Various levels of management and conservation implementation have occurred on the farm. Little documentation of the systems used and practices installed exists. The producer may or may not have a conservation plan or a nutrient management plan. Partial implementation of CNMP-related practices for the AFO has potentially occurred. Resource concerns on the AFO production area and land waste application areas remain to be addressed through the development of a complete CNMP including management and conservation practices for proper manure/wastewater storage and handling, proper disposal of animal mortality, treatment of land application areas to reduce soil erosion to sustainable levels, and application of waste nutrients at an agronomic rate that meets application crop needs and does not exceed site risk analysis assessment condition. Negative air quality impacts and farmstead safety and security issues may remain on the AFO, and recordkeeping methods for crop yields, inspection and monitoring of the existing CNMP-related practices, and manure application and imports/exports may need further improvement.

After Situation:

A certified Technical Services Provider (TSP) has delivered, to the AFO owner/operator, a comprehensive nutrient management plan meeting CNMP CAP criteria (GM - Part 405 - Comprehensive Nutrient Management Plans), and to NRCS the CNMP with Case File data that describes management and conservation practice solutions to all identified resource concerns on the dairy AFO production area and land application areas. Collection, transfer, and storage of manure and wastewater systems, mortality management facilities, as well as any rainfall or runoff diversion systems will be inventoried-evaluated and planned for adequacy according to applicable NRCS conservation practice standard technical criteria by a Professional Engineer. Management and conservation practices in the CNMP document delivered to the client ensure that, if implemented, the AFO will properly, within applicable NRCS standards and specifications, store, handle, and contain manure and wastewater materials generated by the AFO; dispose of AFO mortality; implement conservation practices to reduce soil erosion on land application areas to sustainable levels; land apply waste material nutrients in a manner than meets NRCS 590 Nutrient Management standard technical criteria. Decisions presented within the CNMP have been made to mitigate, if feasible, negative air quality impacts and improve farmland safety and security. Practices selected in the Record of Decision will provide estimated quantities to be installed in units of measure that align with the practice standards. Accurate recordkeeping documents for crop yields, operation and maintenance of existing and new CNMP-related practices, manure application, AFO manure imports and exports, and other information relevant to the management and compliance of the AFO with state and/or local rules and regulations are included in the CNMP. If the CNMP is not implemented all identified resource concerns will still exist.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $14,422.06

Scenario Cost/Unit: $14,422.06

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$103.58	89	$9,218.62
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$78.84	66	$5,203.44

Practice: 102 - Comprehensive Nutrient Management Plan - Written

Scenario: #113 - Livestock Operation Less Than 300 AU without Land Application

Scenario Description:

A Comprehensive Nutrient Management Plan (CNMP) will be developed to address resource concerns on a small Animal Feeding Operation (AFO) currently less than 300 animal units (AU). The producer exports (material transferred to another owner with written documentation of the transfer) nearly all of the manure or organic products from the farm. For operations where manure is both applied to land the AFO owner/operator controls and exported offsite, guidance to determine appropriate CNMP CAP scenario selection shall be provided by NRCS at the state level. The CNMP is a conservation plan that addresses resource concerns on the AFO production area and land application areas owned or controlled by the AFO owner/operator. In this scenario, the primary focus will be addressing resource concerns present on the production area, including manure/wastewater handling and storage, and documentation of manure generation by the AFO, and its export. Production area components of the plan must include animal confinement facilities, feeding and lounging areas, animal mortality facilities, and manure containment and storage facilities. Planned practices on the production area must result in meeting NRCS quality criteria for water quality and soil erosion. Any applicable air emission and negative air quality impacts occurring as a result of planned CNMP activities, or existing on-farm activities must be mitigated in the CNMP if feasible. The CNMP meets the AFO owner/operator's production objectives.

Before Situation:

The owner/operator of a small AFO has not received a written comprehensive nutrient management plan (CNMP) that addresses all resource concerns present on the facility production areas and any applicable land application areas. Partial implementation of CNMP- related practices for the AFO has potentially occurred. Various levels of management and conservation implementation have occurred on the farm. Little documentation of the systems used and practices installed exists. The producer may or may not have a conservation plan or a nutrient management plan. Resource concerns on the AFO production area remain to be addressed through the development of a complete CNMP including management and conservation practices for proper manure/wastewater storage and handling, proper disposal of animal mortality, erosion and runoff issues from feeding and lounging areas, and recordkeeping documentation of manure generation and exports. Negative air quality impacts and farmstead safety and security issues may remain on the AFO, and recordkeeping methods for inspection and monitoring of the existing CNMP-related practices, manure imports/exports may need further improvement.

After Situation:

A certified Technical Services Provider (TSP) has delivered, to the AFO owner/operator, a comprehensive conservation plan meeting CNMP CAP criteria (GM - Part 405 - Comprehensive Nutrient Management Plans), and to NRCS the CNMP Case File that describes management and conservation practice solutions to all identified resource concerns on the small sized AFO production area and any applicable land application areas. Collection, transfer, and storage of manure and wastewater systems, mortality management facilities, as well as any rainfall or runoff diversion systems will be inventoried/evaluated and planned for adequacy according to applicable NRCS conservation practice standard technical criteria by a Professional Engineer. Conservation practices in the CNMP document delivered to the client ensure that, if implemented, the AFO will properly, within applicable NRCS standards and specifications, store, handle, and contain manure and wastewater materials generated by the AFO; dispose of AFO mortality; minimize erosion and runoff from feeding and lounging areas, keep accurate AFO animal inventory information, and document AFO manure generation and exports. Decisions presented within the CNMP have been made to mitigate, if feasible, negative air quality impacts and improve farmland safety and security. Decisions selected in the Record of Decision will provide estimated quantities to be installed in units of measure that align with those in the conservation practice. Accurate recordkeeping documents for operation and maintenance of existing and new CNMP-related practices, AFO manure imports and exports, and other information relevant to the management and compliance of the AFO with state and/or local rules and regulations are included in the CNMP. If the CNMP is not implemented all identified resource concerns will still exist..

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $8,334.24

Scenario Cost/Unit: $8,334.24

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$103.58	66	$6,836.28
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$78.84	19	$1,497.96

Practice: 102 - Comprehensive Nutrient Management Plan - Written

Scenario: #114 - Livestock Operation Greater Than 300 AU without Land Application

Scenario Description:

A Comprehensive Nutrient Management Plan (CNMP) will be developed to address resource concerns on a medium-large Animal Feeding Operation (AFO) currently greater than or equal to 300 animal units (AU). The producer exports (material transferred to another owner with written documentation of the transfer) nearly all of the manure or organic products from the farm. For operations where manure is both applied to land the AFO owner/operator controls and exported offsite, guidance to determine appropriate CNMP CAP scenario selection shall be provided by NRCS at the state level. The CNMP is a conservation plan that addresses resource concerns on the AFO production area and land application areas owned or controlled by the AFO owner/operator. In this scenario, the primary focus will be addressing resource concerns present on the production area, including manure/wastewater handling and storage, and documentation of manure generation by the AFO, and its export. Production area components of the plan must include animal confinement facilities, feeding and lounging lots, animal mortality facilities, and manure containment and storage facilities. Planned practices on the production area must result in meeting NRCS quality criteria for water quality and soil erosion. Any applicable air emission and negative air quality impacts occurring as a result of planned CNMP activities, or existing on-farm activities must be mitigated in the CNMP if feasible. The CNMP meets the AFO owner/operator's production objectives.

Before Situation:

The owner/operator of a medium-large sized AFO has not received a written Comprehensive Nutrient Management Plan (CNMP) that addresses all resource concerns present on the facility production areas and any applicable land application areas. Partial implementation of CNMP-related practices for the AFO has potentially occurred. Various levels of management and conservation implementation have occurred on the farm. Little documentation of the systems used and practices installed exists. The producer may or may not have a conservation plan or a nutrient management plan. Resource concerns on the AFO production area remain to be addressed through the development of a complete CNMP including management and conservation practices for proper manure/wastewater storage and handling, proper disposal of animal mortality, erosion and runoff issues from feeding and lounging areas, and recordkeeping documentation of manure generation and exports. Negative air quality impacts and farmstead safety and security issues may remain on the AFO, and recordkeeping methods for inspection and monitoring of the existing CNMP-related practices, manure imports/exports may need further improvement.

After Situation:

A certified Technical Services Provider (TSP) has delivered, to the AFO owner/operator, a comprehensive conservation plan meeting CNMP CAP criteria (GM - Part 405 - Comprehensive Nutrient Management Plans), and to NRCS a the CNMP Case File that describes management and conservation practice solutions to all identified resource concerns on the small sized AFO production area and any applicable land application areas. Collection, transfer, and storage of manure and wastewater systems, mortality management facilities, as well as any rainfall or runoff diversion systems will be inventoried/evaluated and planned for adequacy according to applicable NRCS conservation practice standard technical criteria by a Professional Engineer. Conservation practices in the CNMP document delivered to the client ensure that, if implemented, the AFO will properly, within applicable NRCS standards and specifications, store, handle, and contain manure and wastewater materials generated by the AFO; dispose of AFO mortality; minimize erosion and runoff from feeding and lounging areas, keep accurate AFO animal inventory information, and document AFO manure generation and exports. Decisions presented within the CNMP have been made to mitigate, if feasible, negative air quality impacts and improve farmland safety and security. Practices selected in the Record of Decision will provide estimated quantities to be installed in units of measure that align with those in the conservation practice. Accurate recordkeeping documents for operation and maintenance of existing and new CNMP-related practices, AFO manure imports and exports, and other information relevant to the management and compliance of the AFO with state and/or local rules and regulations are included in the CNMP. If the CNMP is not implemented all identified resource concerns will still exist.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $10,381.10

Scenario Cost/Unit: $10,381.10

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$103.58	85	$8,804.30
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$78.84	20	$1,576.80

Practice: 102 - Comprehensive Nutrient Management Plan - Written

Scenario: #125 - Dairy Operation Less Than 300 AU with Land Application

Scenario Description:

A Comprehensive Nutrient Management Plan (CNMP) and CNMP Case File will be developed to address resource concerns on a small Dairy Animal Feeding Operation (AFO) currently less than 300 animal units (AU). The producer may export (material transferred to another owner with written documentation of the transfer) modest amounts of the manure or organic products from the farm. For operations where manure is both applied to land the AFO owner/operator controls and exported offsite, guidance to determine appropriate CNMP CAP scenario selection shall be provided by NRCS at the state level. The producer has an animal production area, farms cropland, and applies most nutrients. The CNMP is a conservation plan that addresses resource concerns on the AFO production area and land application areas. Production area components of the plan must include animal confinement facilities, feeding and lounging lots, animal mortality facilities, and manure containment and storage facilities. Land application components of the plan must include all lands under the control of the AFO owner or operator where waste materials are being applied. Planned practices on the production area and land application areas must result in meeting NRCS quality criteria for water quality and soil erosion. Any applicable air emission and negative air quality impacts occurring as a result of planned CNMP activities, or existing on-farm activities must be mitigated in the CNMP if feasible. The CNMP meets the AFO owner/operator's production objectives.

Before Situation:

The owner/operator of a small sized dairy AFO has not received a written Comprehensive Nutrient Management Plan (CNMP) that addresses all resource concerns present on the facility production area and land waste application areas. Various levels of management and conservation implementation have occurred on the farm. Little documentation of the systems used and practices installed exists. The producer may or may not have a conservation plan or a nutrient management plan. Partial implementation of CNMP-related practices for the AFO has potentially occurred. Resource concerns on the AFO production area and land waste application areas remain to be addressed through the development of a complete CNMP including management and conservation practices for proper manure/wastewater storage and handling, proper disposal of animal mortality, treatment of land application areas to reduce soil erosion to sustainable levels, and application of waste nutrients at an agronomic rate that meets application crop needs and does not exceed site risk analysis assessment condition. Negative air quality impacts and farmstead safety and security issues may remain on the AFO, and recordkeeping methods for crop yields, inspection and monitoring of the existing CNMP-related practices, and manure application and imports/exports may need further improvement.

After Situation:

A certified Technical Services Provider (TSP) has delivered, to the AFO owner/operator, a comprehensive nutrient management plan meeting CNMP CAP criteria (GM - Part 405 - Comprehensive Nutrient Management Plans), and to NRCS the CNMP with Case File data that describes management and conservation practice solutions to all identified resource concerns on the small-sized dairy AFO production area and land application areas. Collection, transfer, and storage of manure and wastewater systems, mortality management facilities, as well as any rainfall or runoff diversion systems will be inventoried-evaluated and planned for adequacy according to applicable NRCS conservation practice standard technical criteria by a Professional Engineer. Management and conservation practices in the CNMP document delivered to the client ensure that, if implemented, the AFO will properly, within applicable NRCS standards and specifications, store, handle, and contain manure and wastewater materials generated by the AFO; dispose of AFO mortality; implement conservation practices to reduce soil erosion on land application areas to sustainable levels; land apply waste material nutrients in a manner than meets NRCS 590 Nutrient Management standard technical criteria. Decisions presented within the CNMP have been made to mitigate, if feasible, negative air quality impacts and improve farmland safety and security. Practices selected in the Record of Decision will provide estimated quantities to be installed in units of measure that align with the practice standards. Accurate recordkeeping documents for crop yields, operation and maintenance of existing and new CNMP-related practices, manure application, AFO manure imports and exports, and other information relevant to the management and compliance of the AFO with state and/or local rules and regulations are included in the CNMP. If the CNMP is not implemented all identified resource concerns will still exist.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $11,395.14

Scenario Cost/Unit: $11,395.14

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$103.58	75	$7,768.50
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$78.84	46	$3,626.64

Practice: 102 - Comprehensive Nutrient Management Plan - Written

Scenario: #135 - CNMP Less Than or Equal to 300 AU with Land Application (Minimal Engineer Assistance)

Scenario Description:

A Comprehensive Nutrient Management Plan (CNMP) will be developed to address resource concerns on a small non-dairy Animal Feeding Operation (AFO) currently less than 300 animal units (AU)--primarily swine, poultry, and beef AFOs. This scenario is for sites or states where the services of a professional engineer are minimal. The producer may export modest amounts of the manure or organic products from the farm. For operations where manure is both applied to land the AFO owner/operator controls and exported offsite, guidance to determine appropriate CNMP CAP scenario selection shall be provided by NRCS at the state level. The producer has an animal production area, farms cropland, and applies most nutrients. The CNMP is a conservation plan that addresses resource concerns on the AFO production area and land application areas. Production area components of the plan must include animal confinement facilities, feeding and lounging lots, animal mortality facilities, and manure containment and storage facilities. Land application components of the plan includes all lands under the control of the AFO owner or operator where waste materials are being applied. Planned practices on the production area and land application areas result in meeting NRCS planning criteria for water quality, soil erosion, and air quality concerns. Any applicable air emission and negative air quality impacts occurring as a result of planned CNMP activities, or existing on-farm activities must be mitigated in the CNMP if feasible. The CNMP meets the AFO owner/operator's production objectives.

Before Situation:

The owner/operator of an AFO has not received a written Comprehensive Nutrient Management Plan (CNMP) that addresses all resource concerns present on the facility production area and land waste application areas. Various levels of management and conservation implementation have occurred on the farm. Little documentation of the systems used and practices installed exists. Partial implementation of conservation practices for the AFO has potentially occurred. Resource concerns on the AFO production area and land waste application areas remain to be addressed through the development of a complete CNMP including management and conservation practices for proper manure/wastewater storage and handling, proper disposal of animal mortality, treatment of land application areas to reduce soil erosion to sustainable levels, and application of waste nutrients at an agronomic rate that meets application crop needs and does not exceed site risk analysis assessment condition. Negative air quality impacts may remain on the AFO, and recordkeeping methods for crop yields, inspection and monitoring of the existing CNMP-related practices, and manure application and imports/exports may need further improvement.

After Situation:

A certified Technical Services Provider (TSP) has delivered, to the AFO owner/operator, a comprehensive nutrient management plan meeting CNMP CAP criteria (GM - Part 405 - Comprehensive Nutrient Management Plans), and to NRCS with the CNMP Case File data that describes management and conservation practice systems to address all identified resource concerns on the AFO production area and land application areas. Collection, transfer, and storage of manure and wastewater systems, mortality management facilities, as well as any rainfall or runoff diversion systems will be inventoried-evaluated and planned for adequacy according to applicable NRCS conservation practice standard technical criteria. Management and conservation practices in the CNMP document delivered to the client ensure that, if implemented, the AFO will properly, within applicable NRCS standards and specifications, store, handle, and contain manure and wastewater materials generated by the AFO; dispose of AFO mortality; implement conservation practices to address soil erosion, water quality, and air quality within the NRCS planning criteria. Accurate record keeping documents for crop yields, operation and maintenance of existing and new CNMP-related practices, manure application, AFO manure imports and exports, and other information relevant to the management and compliance of the AFO with state and/or local rules and regulations are included in the CNMP.

Feature Measure: Each

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $4,977.80

Scenario Cost/Unit: $4,977.80

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$103.58	10	$1,035.80
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$78.84	50	$3,942.00

Practice: 102 - Comprehensive Nutrient Management Plan - Written

Scenario: #136 - CNMP Less Than or Equal to 300 AU without Land Application (Minimal Engineer Assistance)

Scenario Description:

A Comprehensive Nutrient Management Plan (CNMP) will be developed to address resource concerns on the Animal Feeding Operation (AFO) currently less than 300 or equal animal units (AU). This scenario is for sites or states where the services of a professional engineer are minimal. The producer exports nearly all of the manure or organic products from the farm. The CNMP is a conservation plan that addresses soil erosion, water quality, and air quality resource concerns on the AFO production area and land application areas owned or controlled by the AFO owner/operator. In this scenario, the primary focus will be addressing soil erosion, water quality, and air quality resource concerns present on the production area, including manure/wastewater handling and storage, and documentation of manure generation by the AFO, and its export. Production area components of the plan must include animal confinement facilities, feeding and lounging areas, animal mortality facilities, and manure containment and storage facilities. Planned practices on the production area must result in meeting NRCS planning criteria for water quality and soil erosion. Any applicable air emission and negative air quality impacts occurring as a result of planned CNMP activities, or existing on-farm activities must be mitigated in the CNMP if feasible. The CNMP meets the AFO owner/operator's production objectives.

Before Situation:

The owner/operator of the AFO has not received a written Comprehensive Nutrient Management Plan (CNMP) that addresses all resource concerns present on the facility production areas and any applicable land application areas. Various levels of management and conservation implementation have occurred on the farm. Little documentation of the systems used and practices installed exists. The producer may or may not have a conservation plan or a nutrient management plan. Resource concerns on the AFO production area remain to be addressed through the development of a complete CNMP including management and conservation practices for proper manure/wastewater storage and handling, proper disposal of animal mortality, erosion and runoff issues from feeding and lounging areas, and record keeping documentation of manure generation and exports. Negative air quality impacts and farmstead safety and security issues may remain on the AFO, and record keeping methods for inspection and monitoring of the existing CNMP-related practices, manure imports/exports may need further improvement.

After Situation:

A certified Technical Services Provider (TSP) has delivered, to the AFO owner/operator, a comprehensive conservation plan meeting CNMP CAP criteria (GM - Part 405 - Comprehensive Nutrient Management Plans), and to NRCS the CNMP Case File that describes management and conservation practice(s) to address all identified soil erosion, water quality, and air quality resource concerns on the AFO production area and any applicable land application areas. Collection, transfer, and storage of manure and wastewater systems, mortality management facilities, as well as any rainfall or runoff diversion systems will be inventoried/evaluated and planned for adequacy according to applicable NRCS conservation practice standard technical criteria. Conservation practices in the CNMP document delivered to the client ensure that, if implemented, the AFO will properly, within applicable NRCS standards and specifications, store, handle, and contain manure and wastewater materials generated by the AFO; dispose of AFO mortality; minimize erosion and runoff from feeding and lounging areas, keep accurate AFO animal inventory information, and document AFO manure generation and exports. Decisions presented within the CNMP have been made to mitigate, if feasible, negative air quality impacts and improve farmland safety and security. Practices selected in the Record of Decision will provide estimated quantities to be installed in units of measure that align with those in the conservation practice. Accurate record keeping documents for operation and maintenance of existing and new CNMP-related practices, AFO manure imports and exports, and other information relevant to the management and compliance of the AFO with state and/or local rules and regulations are included in the CNMP.

Feature Measure: Each

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $3,006.80

Scenario Cost/Unit: $3,006.80

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$103.58	10	$1,035.80
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$78.84	25	$1,971.00

Practice: 102 - Comprehensive Nutrient Management Plan - Written

Scenario: #137 - CNMP Greater Than 300 AU with Land Application (Minimal Engineer Assistance)

Scenario Description:

A Comprehensive Nutrient Management Plan (CNMP) will be developed to address resource concerns on an Animal Feeding Operation (AFO) currently greater than or equal to 300 animal units (AU). This scenario is for sites or states where the services of a professional engineer are minimal. The producer may export modest amounts of the manure or organic products from the farm. For operations where manure is both applied to land the AFO owner/operator controls and exported offsite, guidance to determine appropriate CNMP CAP scenario selection shall be provided by NRCS at the state level. The producer has an animal production area, farms cropland, and applies most manure nutrients. The CNMP is a conservation plan that addresses resource concerns on the AFO production area and land application areas. Production area components of the plan must include animal confinement facilities, feeding and lounging lots, animal mortality facilities, and manure containment and storage facilities. Land application components of the plan must include all lands under the control of the AFO owner or operator where waste materials are being applied. Planned practices on the production area and land application areas must result in meeting NRCS planning criteria for water quality and soil erosion. Any applicable air emission and negative air quality impacts occurring as a result of planned CNMP activities, or existing on-farm activities must be mitigated in the CNMP if feasible. The CNMP meets the AFO owner/operator's production objectives.

Before Situation:

The owner/operator of an AFO has not received a written Comprehensive Nutrient Management Plan (CNMP) that addresses all resource concerns present on the facility production area and land waste application areas. Various levels of management and conservation implementation have occurred on the farm. Little documentation of the systems used and practices installed exists. Partial implementation of CNMP-related practices for the AFO has potentially occurred. Resource concerns on the AFO production area and land waste application areas remain to be addressed through the development of a complete CNMP including management and conservation practices for proper manure/wastewater storage and handling, proper disposal of animal mortality, treatment of land application areas to reduce soil erosion to sustainable levels, and application of waste nutrients at an agronomic rate that meets application crop needs and does not exceed site risk analysis assessment condition. Negative air quality impacts and farmstead safety and security issues may remain on the AFO, and record keeping methods for crop yields, inspection and monitoring of the existing CNMP-related practices, and manure application and imports/exports may need further improvement.

After Situation:

A certified Technical Services Provider (TSP) has delivered, to the AFO owner/operator, a comprehensive nutrient management plan meeting CNMP CAP criteria (GM - Part 405 - Comprehensive Nutrient Management Plans), and to NRCS the CNMP Case File data that describes management and conservation practices to address all identified soil erosion, water quality, and air quality resource concerns on the AFO production area and land application areas. Collection, transfer, and storage of manure and wastewater systems, mortality management facilities, as well as any rainfall or runoff diversion systems will be inventoried-evaluated and planned for adequacy according to applicable NRCS conservation practice standard technical criteria. Management and conservation practices in the CNMP document delivered to the client ensure that, if implemented, the AFO will properly, within applicable NRCS standards and specifications, store, handle, and contain manure and wastewater materials generated by the AFO; dispose of AFO mortality; implement conservation practices to reduce soil erosion on land application areas to sustainable levels; land apply waste material nutrients in a manner than meets NRCS 590 Nutrient Management standard technical criteria. Decisions presented within the CNMP have been made to mitigate, if feasible, negative air quality impacts. Practices selected in the Record of Decision will provide estimated quantities to be installed in units of measure that align with the practice standards. Accurate record keeping documents for crop yields, operation and maintenance of existing and new CNMP-related practices, manure application, AFO manure imports and exports, and other information relevant to the management and compliance of the AFO with state and/or local rules and regulations are included in the CNMP.

Feature Measure: Each

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $6,678.30

Scenario Cost/Unit: $6,678.30

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$103.58	15	$1,553.70
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$78.84	65	$5,124.60

Practice: 102 - Comprehensive Nutrient Management Plan - Written

Scenario: #138 - CNMP Greater Than 300 AU without Land Application (Minimal Engineer Assistance)

Scenario Description:

A Comprehensive Nutrient Management Plan (CNMP) will be developed to address resource concerns on an Animal Feeding Operation (AFO) currently greater than 300 animal units (AU). This scenario is for sites or states where the services of a professional engineer are minimal. The producer exports nearly all of the manure or organic products from the farm. For operations where manure is both applied to land the AFO owner/operator controls and exported offsite, guidance to determine appropriate CNMP CAP scenario selection shall be provided by NRCS at the state level. The CNMP is a conservation plan that addresses the soil erosion, water quality, and air quality resource concerns on the AFO production area and land application areas owned or controlled by the AFO owner/operator. In this scenario, the primary focus will be addressing resource concerns present on the production area, including manure/wastewater handling and storage, and documentation of manure generation by the AFO, and its export. Production area components of the plan must include animal confinement facilities, feeding and lounging lots, animal mortality facilities, and manure containment and storage facilities. Planned practices on the production area must result in meeting NRCS planning criteria for water quality and soil erosion. Any applicable air emission and negative air quality impacts occurring as a result of planned CNMP activities, or existing on-farm activities must be mitigated in the CNMP if feasible. The CNMP meets the AFO owner/operator's production objectives.

Before Situation:

The owner/operator of an AFO has not received a written Comprehensive Nutrient Management Plan (CNMP) that addresses the soil erosion, water quality, and air quality resource concerns present on the facility production areas and any applicable land application areas. Various levels of management and conservation implementation have occurred on the farm. Little documentation of the systems used and practices installed exists. The producer may or may not have a conservation plan or a nutrient management plan. Resource concerns on the AFO production area remain to be addressed through the development of a complete CNMP including management and conservation practices for proper manure/wastewater storage and handling, proper disposal of animal mortality, soil erosion, water quality, and air quality concerns from feeding and lounging areas, and record keeping documentation of manure generation and exports. Negative air quality impacts may remain on the AFO, and record keeping methods for inspection and monitoring of the existing CNMP-related practices, manure imports/exports may need further improvement.

After Situation:

A certified Technical Services Provider (TSP) has delivered, to the AFO owner/operator, a comprehensive conservation plan meeting CNMP CAP criteria (GM - Part 405 - Comprehensive Nutrient Management Plans), and to NRCS the CNMP Case File that describes management and conservation practice solutions to all identified resource concerns on the small sized AFO production area and any applicable land application areas. Collection, transfer, and storage of manure and wastewater systems, mortality management facilities, as well as any rainfall or runoff diversion systems are inventoried/evaluated and planned for adequacy according to applicable NRCS conservation practice standard technical criteria. Conservation practices in the CNMP document delivered to the client ensure that, if implemented, the AFO will properly, within applicable NRCS standards and specifications, store, handle, and contain manure and wastewater materials generated by the AFO; dispose of AFO mortality; minimize soil erosion, water quality, and air quality concerns from feeding and lounging areas, keep accurate AFO animal inventory information, and document AFO manure generation and exports. Decisions presented within the CNMP have been made to mitigate, if feasible, negative air quality impacts. Practices selected in the Record of Decisions will provide estimated quantities to be installed in units of measure that align with those in the conservation practice. Accurate record keeping documents for operation and maintenance of existing and new CNMP-related practices, AFO manure imports and exports, and other information relevant to the management and compliance of the AFO with state and/or local rules and regulations are included in the CNMP.

Feature Measure: Each

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $3,401.00

Scenario Cost/Unit: $3,401.00

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$103.58	10	$1,035.80
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$78.84	30	$2,365.20

Practice: 102 - Comprehensive Nutrient Management Plan - Written

Scenario: #150 - CNMP Revision

Scenario Description:

A Comprehensive Nutrient Management Plan (CNMP) will be revised to address changes in manure management, volume or analysis, plants and crops, or plant and crop management or to adjust the nutrient balance on an Animal Feeding Operation (AFO). No modifications are required to engineered practices in the farmstead/production area. This scenario is where the services of a professional engineer are typically not required. The producer may export manure or organic products from the farm. The producer has an animal production area and land applies nutrients. The CNMP is a conservation plan that addresses resource concerns on the AFO production area and land application areas. Production area components of the plan may include animal confinement facilities, feeding and lounging lots, animal mortality facilities, and manure containment and storage facilities. All production area components are considered adequate. Land application components of the plan includes all lands under the control of the AFO owner or operator where nutrients are being applied. Planned practices on the land application area result in meeting NRCS planning criteria for water quality, soil erosion, and air quality concerns. Any applicable air emission and negative air quality impacts occurring because of planned CNMP activities, or existing on-farm activities must be mitigated in the CNMP if feasible. The CNMP meets the AFO owner/operator's production objectives. CNMP Revision CAP may not be used more often that once every five years, although it is recognized the nutrient management plan may be updated more frequently based on soil test frequency or other factors.

Before Situation:

The owner/operator of an AFO has an existing written Comprehensive Nutrient Management Plan (CNMP) that addresses the current required resource concerns and client objectives present on the facility production area and land application areas. The CNMP is out of date or does not meet current needs or objectives. Various levels of management and conservation implementation have changed on the operation. Soil tests, manure analyses, or changes in cropping system require that the nutrient balance be adjusted to bring the CNMP up to date.

After Situation:

A certified Technical Services Provider (TSP) has developed a comprehensive nutrient management plan meeting CNMP CAP criteria (GM – Part 405 - Comprehensive Nutrient Management Plans) for the AFO owner/operator and has delivered to NRCS the CNMP with the CNMP Case File data that describes management and conservation practice systems to address all identified required resource concerns on the AFO production area and land application areas. Management and conservation practices in the CNMP document delivered to the client ensure that, if implemented, the AFO will operate properly, within applicable NRCS standards and specifications, to store, handle, and contain manure and wastewater materials generated by the AFO; dispose of AFO mortality; implement conservation practices to address soil erosion, water quality, and air quality within the NRCS planning criteria. Required record keeping for land treatment, nutrient management, and other information relevant to the management and compliance of the AFO with state and/or local rules and regulations are identified in the CNMP.

Feature Measure: Each

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $3,671.50

Scenario Cost/Unit: $3,671.50

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$103.58	5	$517.90
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$78.84	40	$3,153.60

Practice: 104 - Nutrient Management Plan - Written

Scenario: #80 - Nutrient Management CAP Less Than or Equal to 100 Acres (Not part of a CNMP)

Scenario Description:

Various on-farm land uses where natural or artificial amendments are applied. Natural Resource Concern: Water Quality, Soil Erosion, Water Quantity, and other associated resource concerns.

Before Situation:

Agricultural producer has no plan or minimal knowledge for the application and management of nutrients. The producer currently manages nutrient application based upon personal knowledge, or other local criteria. Producer is interested in management of nutrients to maximize yields, improve profit margins, reduce costs, and for environmental benefit. Producer is willing to collaborate with a certified TSP to develop a plan.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Nutrient Management conservation activity plan consistent with the criteria in CAP 104 and 590 Nutrient Management. The CAP criteria requires the plan to meet quality criteria for the primary Water Quality resource concern and other applicable resource concerns and provides for opportunities to manage nutrients for plant production and address offsite movement of nutrients. The CAP plan may include recommendations for associated conservation practices which address other related resource concerns. CAP meets the basic quality criteria for the 104 plan as cited in the NRCS Field Office Technical Guide and CPS 590 Nutrient Management.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $2,408.70

Scenario Cost/Unit: $2,408.70

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hours	$80.29	30	$2,408.70

Practice: 104 - Nutrient Management Plan - Written

Scenario: #81 - Nutrient Management CAP 101-300 Acres (Not part of a CNMP)

Scenario Description:

Various on-farm land uses where organic or inorganic amendments are applied. Natural Resource Concern: Water Quality, Soil Erosion, Water Quantity, and other associated resource concerns.

Before Situation:

Agricultural producer has no plan or minimal knowledge for application and management of land applied nutrients. The producer currently manages nutrient application based upon label instructions, personal knowledge, or other local criteria. Producer is interested in management of nutrients to maximize yields, improve profit margins, reduce costs, increase nutrient use efficiency and for environmental benefits. Producer is willing to collaborate with a certified TSP to develop a plan.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for the development of the Nutrient Management Conservation Activity Plan (CAP). The CAP criteria requires the plan to meet Nutrient Management criteria for the primary Water Quality resource concern and other applicable resource concerns and provides for opportunities to manage nutrients for plant production and address offsite movement of nutrients. The CAP plan may include recommendations for associated conservation practices which address other related resource concerns. CAP meets the basic criteria for the 104 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $3,211.60

Scenario Cost/Unit: $3,211.60

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hours	$80.29	40	$3,211.60

Practice: 104 - Nutrient Management Plan - Written

Scenario: #82 - Nutrient Management CAP Greater Than 300 Acres (Not part of a CNMP)

Scenario Description:

Various on-farm land uses where organic or inorganic amendments are applied. Natural Resource Concern: Water Quality, Soil Erosion, Water Quantity, and other associated resource concerns.

Before Situation:

Agricultural producer has no plan or minimal knowledge for the application and management of land applied nutrients. The producer currently manages nutrient application based upon label instructions, personal knowledge, or other local criteria. Producer is interested in management of nutrients to maximize yields, increase profit margins, reduce costs, improve nutrient use efficiency, and for environmental benefits. Producer is willing to collaborate with a certified TSP to develop a plan.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Nutrient Management Conservation Activity Plan (CAP). The CAP criteria requires the plan to meet quality criteria for the primary Water Quality resource concern and other applicable resource concerns and provides for opportunities to manage nutrients for plant production and address offsite movement of nutrients. The CAP plan may include recommendations for associated conservation practices which address other related resource concerns. CAP meets the basic criteria for the 104 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $4,014.50

Scenario Cost/Unit: $4,014.50

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hours	$80.29	50	$4,014.50

Practice: 104 - Nutrient Management Plan - Written

Scenario: #83 - Nutrient Management CAP Less Than or Equal to 100 Acres (Element of a CNMP)

Scenario Description:

Various on-farm land uses where natural or artificial nutrient amendments are applied. Natural Resource Concern: Water Quality, Soil Erosion, Water Quantity, and other associated resource concerns.

Before Situation:

Agricultural producer has no plan or minimal knowledge for the application and management of nutrients applied to the land. The producer currently manages nutrient application based upon label instructions, personal knowledge, or other local criteria. Producer is interested in management of nutrients to maximize yields, improve profit margins, reduce costs, and for environmental benefits. Producer is willing to collaborate with a certified TSP to develop a plan.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for the development of the Nutrient Management Conservation Activity Plan (CAP). The CAP criteria requires the plan to meet nutrient criteria for the primary Water Quality resource concern in 590 and other applicable resource concerns and provides for opportunities to manage nutrients for plant production and address offsite movement of nutrients. The CAP plan may include recommendations for associated conservation practices which address other related resource concerns. CAP meets the basic criteria for the 104 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $4,014.50

Scenario Cost/Unit: $4,014.50

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hours	$80.29	50	$4,014.50

Practice: 104 - Nutrient Management Plan - Written

Scenario: #84 - Nutrient Management CAP 101-300 Acres (Element of a CNMP)

Scenario Description:

Various on-farm land uses where organic or inorganic amendments are applied. Natural Resource Concern: Water Quality, Soil Erosion, Water Quantity, and other associated resource concerns.

Before Situation:

Agricultural producer has no plan or minimal knowledge for application and management of applied nutrients to the land. The producer currently manages nutrient application based upon label instructions, personal knowledge, or other local criteria. Producer is interested in management of nutrients to maximize yields, profits margin, reduce costs, and for environmental benefit. Producer is willing to collaborate with a certified TSP to develop a plan.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for the development of the Nutrient Management Conservation Activity Plan (CAP). The CAP criteria requires the plan to meet 590 criteria for the primary Water Quality resource concern and other applicable resource concerns, and provides for opportunities to manage nutrients for plant production and address offsite movement of nutrients. The CAP plan may include recommendations for associated conservation practices which address other related resource concerns. The CAP meets the basic quality criteria for the 104 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $5,620.30

Scenario Cost/Unit: $5,620.30

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hours	$80.29	70	$5,620.30

Practice: 104 - Nutrient Management Plan - Written

Scenario: #85 - Nutrient Management CAP Greater Than 300 Acres (Element of a CNMP)

Scenario Description:

Various on-farm land uses where organic or inorganic amendments are applied. Natural Resource Concern: Water Quality, Soil Erosion, Water Quantity, and other associated resource concerns.

Before Situation:

Agricultural producer has no plan or minimal knowledge for the application and management of nutrients applied to the land. The producer currently manages nutrient application based upon label instructions, personal knowledge, or other local criteria. Producer is interested in management of nutrients to maximize yields, improve profit margins, reduce costs, and for environmental benefits. Producer is willing to collaborate with a certified TSP to develop a plan.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Nutrient Management Conservation Activity Plan (CAP). The CAP criteria requires the plan to meet 590 criteria for the primary Water Quality resource concern and other applicable resource concerns and provides for opportunities to manage nutrients for plant production and address offsite movement of nutrients. The CAP plan may include recommendations for associated conservation practices which address other related resource concerns. CAP meets the basic criteria for the 104 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $6,824.65

Scenario Cost/Unit: $6,824.65

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hours	$80.29	85	$6,824.65

Practice: 106 - Forest Management Plan - Written

Scenario: #86 - FMP Less Than or Equal to 20 acres

Scenario Description:

Non Industrial Private Forest Land typically unmanaged or limited management activities. Typical site is approximately 1 to 20 acres in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

Before Situation:

The producer currently manages forested lands without an existing forest management plan, or with an outdated plan. Resource concern(s) exist which are not addressed by a management plan. A Forest Management Plan or Conservation Activity Plan, as defined by EQIP regulation is needed to allow the producer to apply for financial assistance through EQIP or other programs to help implement needed conservation practices. Associated Practices: 472, 666, 654, 655,384, 394, 383, 379, 338, 391, 791, 490, 612, 660, 311, 380.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Forest Management Conservation Activity Plan (CAP). The CAP criteria requires the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Forest Management CAP is not considered a Forest Harvest Plan, but should complement the needs for harvest if desired by the land user. Additional CAP plan criteria is detailed in the Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $1,448.94

Scenario Cost/Unit: $1,448.94

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, forester	1302	Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage.	Hours	$76.26	19	$1,448.94

Practice: 106 - Forest Management Plan - Written

Scenario: #87 - FMP 21 to 100 acres

Scenario Description:

Non Industrial Private Forest Land typically unmanaged or limited management activities. Typical site is approximately 21 to 100 acres in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

Before Situation:

The producer currently manages forested lands without an existing forest management plan, or with an outdated plan. Resource concern(s) exist which are not addressed by a management plan. A Forest Management Plan or Conservation Activity Plan, as defined by EQIP regulation is needed to allow the producer to apply for financial assistance through EQIP or other programs to help implement needed conservation practices. Associated Practices: 472, 666, 654, 655,384, 394, 383, 379, 338, 391, 791, 490, 612, 660, 311, 380.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Forest Management Conservation Activity Plan (CAP). The CAP criteria requires the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Forest Management CAP is not considered a Forest Harvest Plan, but should complement the needs for harvest if desired by the land user. Additional CAP plan criteria is detailed in the Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $1,830.24

Scenario Cost/Unit: $1,830.24

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, forester	1302	Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage.	Hours	$76.26	24	$1,830.24

Practice: 106 - Forest Management Plan - Written

Scenario: #88 - FMP 101 to 250 acres

Scenario Description:

Non Industrial Private Forest Land typically unmanaged or limited management activities. Typical site is approximately 101 to 250 acres in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

Before Situation:

The producer currently manages forested lands without an existing forest management plan, or with an outdated plan. Resource concern(s) exist which are not addressed by a management plan. A Forest Management Plan or Conservation Activity Plan, as defined by EQIP regulation is needed to allow the producer to apply for financial assistance through EQIP or other programs to help implement needed conservation practices. Associated Practices: 472, 666, 654, 655,384, 394, 383, 379, 338, 391, 791, 490, 612, 660, 311, 380.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Forest Management Conservation Activity Plan (CAP). The CAP criteria requires the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Forest Management CAP is not considered a Forest Harvest Plan, but should complement the needs for harvest if desired by the land user. Additional CAP plan criteria is detailed in the Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $3,279.18

Scenario Cost/Unit: $3,279.18

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, forester	1302	Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage.	Hours	$76.26	43	$3,279.18

Practice: 106 - Forest Management Plan - Written

Scenario: #89 - FMP Greater Than 1000 acres

Scenario Description:

Non Industrial Private Forest Land typically unmanaged or limited management activities. Typical site is approximately 1001 acres or greater in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

Before Situation:

The producer currently manages forested lands without an existing forest management plan, or with an outdated plan. Resource concern(s) exist which are not addressed by a management plan. A Forest Management Plan or Conservation Activity Plan, as defined by EQIP regulation is needed to allow the producer to apply for financial assistance through EQIP or other programs to help implement needed conservation practices. Associated Practices: 472, 666, 654, 655,384, 394, 383, 379, 338, 391, 791, 490, 612, 660, 311, 380.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Forest Management Conservation Activity Plan (CAP). The CAP criteria requires the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Forest Management CAP is not considered a Forest Harvest Plan, but should complement the needs for harvest if desired by the land user. Additional CAP plan criteria is detailed in the Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $6,863.40

Scenario Cost/Unit: $6,863.40

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, forester	1302	Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage.	Hours	$76.26	90	$6,863.40

Practice: 106 - Forest Management Plan - Written

Scenario: #90 - FMP 251 to 500 acres

Scenario Description:

Non Industrial Private Forest Land typically unmanaged or limited management activities. Typical site is approximately 251 to 500 acres in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

Before Situation:

The producer currently manages forested lands without an existing forest management plan, or with an outdated plan. Resource concern(s) exist which are not addressed by a management plan. A Forest Management Plan or Conservation Activity Plan, as defined by EQIP regulation is needed to allow the producer to apply for financial assistance through EQIP or other programs to help implement needed conservation practices. Associated Practices: 472, 666, 654, 655,384, 394, 383, 379, 338, 391, 791, 490, 612, 660, 311, 380.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Forest Management Conservation Activity Plan (CAP). The CAP criteria requires the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Forest Management CAP is not considered a Forest Harvest Plan, but should complement the needs for harvest if desired by the land user. Additional CAP plan criteria is detailed in the Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $4,728.12

Scenario Cost/Unit: $4,728.12

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, forester	1302	Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage.	Hours	$76.26	62	$4,728.12

Practice: 106 - Forest Management Plan - Written

Scenario: #91 - FMP 501 to 1000 acres

Scenario Description:

Non Industrial Private Forest Land typically unmanaged or limited management activities. Typical site is approximately 501 to 1000 acres in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

Before Situation:

The producer currently manages forested lands without an existing forest management plan, or with an outdated plan. Resource concern(s) exist which are not addressed by a management plan. A Forest Management Plan or Conservation Activity Plan, as defined by EQIP regulation is needed to allow the producer to apply for financial assistance through EQIP or other programs to help implement needed conservation practices. Associated Practices: 472, 666, 654, 655,384, 394, 383, 379, 338, 391, 791, 490, 612, 660, 311, 380.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Forest Management Conservation Activity Plan (CAP). The CAP criteria requires the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Forest Management CAP is not considered a Forest Harvest Plan, but should complement the needs for harvest if desired by the land user. Additional CAP plan criteria is detailed in the Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $5,490.72

Scenario Cost/Unit: $5,490.72

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, forester	1302	Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage.	Hours	$76.26	72	$5,490.72

Practice: 108 - Feed Management Plan - Written

Scenario: #80 - Feed Management Plan

Scenario Description:

The owner/operator of an Animal Feeding Operation (AFO) has not received a written Feed Management Plan (FeedMP) that addresses all resource concerns present on the facility. Various levels of management and conservation implementation has occurred in the operation. Little documentation of the methods of feed management used and practices installed exists, and the producer is not likely to developed a complete forage inventory or nutrient analysis. The producer may or may not have a conservation plan or a nutrient management plan. Nutrient management related resource concerns on the operation remain to be addressed through the development of a complete FeedMP including management and conservation practices for proper quantity and quality of available nutrients, feedstuffs, and/or additives fed to livestock or poultry that may be present on the operation. Present operation and feed methodology poses risk of feeding excessive amounts of nutrients in animal manure which result in negative impacts to water quality and odor resource concerns. Negative water and air quality impacts as well as farmstead safety and security issues may remain on the AFO, and inadequate recordkeeping nutrient, inspection and monitoring of the existing operation may need further improvement.

Before Situation:

Producer has no plan or limited knowledge of management of feed, nutrients, feedstuffs, or nutritional additives provided to domestic livestock and poultry. The producer currently manages feed without a plan which would address livestock production limitations and water and air quality resource concern impacts. Producer currently lacks plan to provide proper balance of forage, grains or other feeds and supplements to assure domestic animal nutritional needs are met without negatively impacting water and air quality. Producer is interested in management of feed for domestic animals to maximize profit margin, reduce costs, improve or address livestock production opportunities, and for other environmental benefits. Producer is willing to collaborate with a certified Technical Service Provider (TSP) to develop a plan, and to collect/coordinate data and records to determine current nutritional needs. Associated Practice(s): 590-Nutrient Management

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Feed Management Conservation Activity Plan (CAP). The CAP criteria requires the plan to meet quality criteria for applicable natural resource concerns and provides for opportunities to identify and implement conservation practices related to management of feed, forages, or delivery of supplements to maximize efficient feeding operations and livestock growth. The CAP plan may serve as the basis for implementation of the primary conservation practice 592 - Feed Management. If applicable, the CAP may also be developed to complement Comprehensive Nutrient Management Plans (CNMP) or to help meet requirements of NRCS practice standard 590 - Nutrient Management. As addressed in the CAP planning criteria, the plan may include recommendations for addressing associated natural resource concerns with other conservation practices. The Feed Management CAP meets the basic quality criteria for the 108 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $3,153.60

Scenario Cost/Unit: $3,153.60

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$78.84	40	$3,153.60

Practice: 110 - Grazing Management Plan - Written

Scenario: #1 - Grazing Management Plan Less Than or Equal to 100 acres

Scenario Description:

Small agricultural operation with less than 100 acres grazed land. Natural Resource Concern: Soil erosion, water quality, fish and wildlife, plant condition, and all other appropriate resource concerns.

Before Situation:

Producer has no plan or limited knowledge of management of livestock or other animals on grazed land resources. The producer currently manages animals without a plan to address identified natural resource concerns. Producer is interested in management of animals to maximize profit margins, reduce costs, improve or address wildlife opportunities, and for other environmental benefit. Producer is willing to collaborate with a certified TSP to develop a plan and collect/coordinate data recording to monitor per requirements of plan. Associated Practices: In addition to the essential practices listed previously, addition practices to consider include: Channel Bank Vegetation, Prescribed Burning, Critical Area Planting, Pond, Windbreak/Shelterbelt Establishment, Silvopasture Establishment, Riparian Herbaceous Cover, Stream Habitat Improvement and Management, Pipeline, Heavy Use Area Protection, Spring Development, and Animal Trails and Walkways.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Grazing Management Conservation Activity Plan (CAP). The CAP criteria requires the plan to meet quality criteria for applicable resource concerns and provide for opportunities to implement essential conservation practices: Brush Management, Fencing, Firebreak, Forage Harvest Management, Grazing Land Mechanical Treatment, Herbaceous Weed Treatment, Nutrient Management, Forage and Biomass Planting, Prescribed Grazing, Range Planting, Access Control, and Watering Facilities. As addressed in the CAP criteria, the plan may include recommendations for associated conservation practices which address other related resource concerns. The CAP meets the basic quality criteria for the 110 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $2,350.80

Scenario Cost/Unit: $2,350.80

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, range conservation	1299	Conservation Activity Plan labor to study, plan the use and management of rangelands to maximize their use in a sustainable manner. Range managers may inventory soils, plants, and animals; develop resource management plans; identify monitoring methods and collect data using those methods to determine if resource management objectives are being met or if adjustments to management activities are needed. For example, they may help ranchers attain optimum livestock production by determining the number and kind of animals to graze, the grazing system to use, and the best season for grazing. Cost associated with this component includes overhead and benefits (market price).	Hours	$78.36	30	$2,350.80

Practice: 110 - Grazing Management Plan - Written

Scenario: #2 - Grazing Management Plan 101 to 500 acres

Scenario Description:

Small agricultural operation with 101 to 500 acres grazed land. Natural Resource Concern: Soil erosion, water quality, fish and wildlife, plant condition, and all other appropriate resource concerns.

Before Situation:

Producer has no plan or limited knowledge of management of livestock or other animals on grazed land resources. The producer currently manages animals without a plan to address identified natural resource concerns. Producer is interested in management of animals to maximize profit margins, reduce costs, improve or address wildlife opportunities, and for other environmental benefit. Producer is willing to collaborate with a certified TSP to develop a plan and collect/coordinate data recording to monitor per requirements of plan. Associated Practices: In addition to the essential practices listed previously, addition practices to consider include: Channel Bank Vegetation, Prescribed Burning, Critical Area Planting, Pond, Windbreak/Shelterbelt Establishment, Silvopasture Establishment, Riparian Herbaceous Cover, Stream Habitat Improvement and Management, Pipeline, Heavy Use Area Protection, Spring Development, and Animal Trails and Walkways.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Grazing Management Conservation Activity Plan (CAP). The CAP criteria requires the plan to meet quality criteria for applicable resource concerns and provide for opportunities to implement essential conservation practices: Brush Management, Fencing, Firebreak, Forage Harvest Management, Grazing Land Mechanical Treatment, Herbaceous Weed Treatment, Nutrient Management, Forage and Biomass Planting, Prescribed Grazing, Range Planting, Access Control, and Watering Facilities. As addressed in the CAP criteria, the plan may include recommendations for associated conservation practices which address other related resource concerns. The CAP meets the basic quality criteria for the 110 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $3,134.40

Scenario Cost/Unit: $3,134.40

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, range conservation	1299	Conservation Activity Plan labor to study, plan the use and management of rangelands to maximize their use in a sustainable manner. Range managers may inventory soils, plants, and animals; develop resource management plans; identify monitoring methods and collect data using those methods to determine if resource management objectives are being met or if adjustments to management activities are needed. For example, they may help ranchers attain optimum livestock production by determining the number and kind of animals to graze, the grazing system to use, and the best season for grazing. Cost associated with this component includes overhead and benefits (market price).	Hours	$78.36	40	$3,134.40

Practice: 110 - Grazing Management Plan - Written

Scenario: #3 - Grazing Management Plan 1501 to 5000 acres

Scenario Description:

Small agricultural operation with 1501 to 5000 acres grazed land. Natural Resource Concern: Soil erosion, water quality, fish and wildlife, plant condition, and all other appropriate resource concerns.

Before Situation:

Producer has no plan or limited knowledge of management of livestock or other animals on grazed land resources. The producer currently manages animals without a plan to address identified natural resource concerns. Producer is interested in management of animals to maximize profit margins, reduce costs, improve or address wildlife opportunities, and for other environmental benefit. Producer is willing to collaborate with a certified TSP to develop a plan and collect/coordinate data recording to monitor per requirements of plan. Associated Practices: In addition to the essential practices listed previously, addition practices to consider include: Channel Bank Vegetation, Prescribed Burning, Critical Area Planting, Pond, Windbreak/Shelterbelt Establishment, Silvopasture Establishment, Riparian Herbaceous Cover, Stream Habitat Improvement and Management, Pipeline, Heavy Use Area Protection, Spring Development, and Animal Trails and Walkways.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Grazing Management Conservation Activity Plan (CAP). The CAP criteria requires the plan to meet quality criteria for applicable resource concerns and provide for opportunities to implement essential conservation practices: Brush Management, Fencing, Firebreak, Forage Harvest Management, Grazing Land Mechanical Treatment, Herbaceous Weed Treatment, Nutrient Management, Forage and Biomass Planting, Prescribed Grazing, Range Planting, Access Control, and Watering Facilities. As addressed in the CAP criteria, the plan may include recommendations for associated conservation practices which address other related resource concerns. The CAP meets the basic quality criteria for the 110 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $4,701.60

Scenario Cost/Unit: $4,701.60

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, range conservation	1299	Conservation Activity Plan labor to study, plan the use and management of rangelands to maximize their use in a sustainable manner. Range managers may inventory soils, plants, and animals; develop resource management plans; identify monitoring methods and collect data using those methods to determine if resource management objectives are being met or if adjustments to management activities are needed. For example, they may help ranchers attain optimum livestock production by determining the number and kind of animals to graze, the grazing system to use, and the best season for grazing. Cost associated with this component includes overhead and benefits (market price).	Hours	$78.36	60	$4,701.60

Practice: 110 - Grazing Management Plan - Written

Scenario: #5 - Grazing Management Plan Greater Than 5000 acres

Scenario Description:

Small agricultural operation with more than 5000 acres grazed land. Natural Resource Concern: Soil erosion, water quality, fish and wildlife, plant condition, and all other appropriate resource concerns.

Before Situation:

Producer has no plan or limited knowledge of management of livestock or other animals on grazed land resources. The producer currently manages animals without a plan to address identified natural resource concerns. Producer is interested in management of animals to maximize profit margins, reduce costs, improve or address wildlife opportunities, and for other environmental benefit. Producer is willing to collaborate with a certified TSP to develop a plan and collect/coordinate data recording to monitor per requirements of plan. Associated Practices: In addition to the essential practices listed previously, addition practices to consider include: Channel Bank Vegetation, Prescribed Burning, Critical Area Planting, Pond, Windbreak/Shelterbelt Establishment, Silvopasture Establishment, Riparian Herbaceous Cover, Stream Habitat Improvement and Management, Pipeline, Heavy Use Area Protection, Spring Development, and Animal Trails and Walkways.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Grazing Management Conservation Activity Plan (CAP). The CAP criteria requires the plan to meet quality criteria for applicable resource concerns and provide for opportunities to implement essential conservation practices: Brush Management, Fencing, Firebreak, Forage Harvest Management, Grazing Land Mechanical Treatment, Herbaceous Weed Treatment, Nutrient Management, Forage and Biomass Planting, Prescribed Grazing, Range Planting, Access Control, and Watering Facilities. As addressed in the CAP criteria, the plan may include recommendations for associated conservation practices which address other related resource concerns. The CAP meets the basic quality criteria for the 110 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $5,485.20

Scenario Cost/Unit: $5,485.20

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, range conservation	1299	Conservation Activity Plan labor to study, plan the use and management of rangelands to maximize their use in a sustainable manner. Range managers may inventory soils, plants, and animals; develop resource management plans; identify monitoring methods and collect data using those methods to determine if resource management objectives are being met or if adjustments to management activities are needed. For example, they may help ranchers attain optimum livestock production by determining the number and kind of animals to graze, the grazing system to use, and the best season for grazing. Cost associated with this component includes overhead and benefits (market price).	Hours	$78.36	70	$5,485.20

Practice: 110 - Grazing Management Plan - Written

Scenario: #66 - Grazing Management Plan 501 to 1500 acres

Scenario Description:

Small agricultural operation with 501 to 1500 acres grazed land. Natural Resource Concern: Soil erosion, water quality, fish and wildlife, plant condition, and all other appropriate resource concerns.

Before Situation:

Producer has no plan or limited knowledge of management of livestock or other animals on grazed land resources. The producer currently manages animals without a plan to address identified natural resource concerns. Producer is interested in management of animals to maximize profit margins, reduce costs, improve or address wildlife opportunities, and for other environmental benefit. Producer is willing to collaborate with a certified TSP to develop a plan and collect/coordinate data recording to monitor per requirements of plan. Associated Practices: In addition to the essential practices listed previously, addition practices to consider include: Channel Bank Vegetation, Prescribed Burning, Critical Area Planting, Pond, Windbreak/Shelterbelt Establishment, Silvopasture Establishment, Riparian Herbaceous Cover, Stream Habitat Improvement and Management, Pipeline, Heavy Use Area Protection, Spring Development, and Animal Trails and Walkways.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Grazing Management Conservation Activity Plan (CAP). The CAP criteria requires the plan to meet quality criteria for applicable resource concerns and provide for opportunities to implement essential conservation practices: Brush Management, Fencing, Firebreak, Forage Harvest Management, Grazing Land Mechanical Treatment, Herbaceous Weed Treatment, Nutrient Management, Forage and Biomass Planting, Prescribed Grazing, Range Planting, Access Control, and Watering Facilities. As addressed in the CAP criteria, the plan may include recommendations for associated conservation practices which address other related resource concerns. The CAP meets the basic quality criteria for the 110 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number of plans

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $3,918.00

Scenario Cost/Unit: $3,918.00

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, range conservation	1299	Conservation Activity Plan labor to study, plan the use and management of rangelands to maximize their use in a sustainable manner. Range managers may inventory soils, plants, and animals; develop resource management plans; identify monitoring methods and collect data using those methods to determine if resource management objectives are being met or if adjustments to management activities are needed. For example, they may help ranchers attain optimum livestock production by determining the number and kind of animals to graze, the grazing system to use, and the best season for grazing. Cost associated with this component includes overhead and benefits (market price).	Hours	$78.36	50	$3,918.00

Practice: 112 - Prescribed Burning Plan - Written

Scenario: #73 - Prescribed Burning Plan Less Than or Equal to 20 Acres

Scenario Description:

Non Industrial Private Forest Land, Pasture or Range Land typically less than or equal to 20 acres in size and is dominated by fire tolerant species that are competing with undesirable vegetation and accumulating fuel load. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition.

Before Situation:

Producer has no existing plan or an obsolete plan that is insufficient for current stand condition. Due to the size, landscape position, low to moderate fuel loads and presence of both natural firebreaks (i.e., streams, lakes, etc.) and man-made firebreaks (i.e., roads, farm paths, agricultural fields, etc.), few newly constructed firebreaks are needed to implement the prescribed burn. A Prescribed Burning Plan or Conservation Activity Plan is needed to enable the producer to apply for financial assistance through EQIP or other financial assistance programs in order to implement needed conservation practices. Associated Practices: 394, 383, 384, 528, 314, 315, 550, 644, 645, 659, 342, 647, 460, 643, 666, 595

After Situation:

After EQIP contract approval, participant has obtained services from a certified Technical Service Provider (TSP) for development of the Prescribed Burning Conservation Activity Plan (CAP). The CAP criteria require the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Prescribed Burning Plan CAP is not considered a Forest Management Plan, a Reforestation Plan, a Forest Harvest Plan, or a Prescribed Grazing Plan, but should complement the needs of those plans if they exist and if desired by the decision maker. The CAP plan will fully describe all aspects of the prescribed burn including, but not limited to objectives of the burn (i.e., site preparation, wildlife habitat, etc.), site conditions (i.e., fuel load, fuel type, etc.), implementation strategies (i.e., method of ignition, number of persons required, equipment needs, etc.), tolerable weather parameters (i.e., wind direction, relative humidity, mixing height, etc.) and identification of Smoke Sensitive Areas. Additional CAP plan criteria are detailed in the Field Office Technical Guide and potentially state developed technical criteria.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $381.30

Scenario Cost/Unit: $381.30

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, forester	1302	Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage.	Hours	$76.26	5	$381.30

Practice: 112 - Prescribed Burning Plan - Written

Scenario: #74 - Prescribed Burning Plan 21-100 Acres

Scenario Description:

Non Industrial Private Forest Land, Pasture or Range Land typically 21 to 100 acres in size and is dominated by fire tolerant species that are competing with undesirable vegetation and accumulating fuel load. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition.

Before Situation:

Producer has no existing plan or an obsolete plan that is insufficient for current stand condition. Due to the size, landscape position, low to moderate fuel loads and presence of both natural firebreaks (i.e., streams, lakes, etc.) and man-made firebreaks (i.e., roads, farm paths, agricultural fields, etc.), few newly constructed firebreaks are needed to implement the prescribed burn. A Prescribed Burning Plan or Conservation Activity Plan is needed to enable the producer to apply for financial assistance through EQIP or other financial assistance programs in order to implement needed conservation practices. Associated Practices: 394, 383, 384, 528, 314, 315, 550, 644, 645, 659, 342, 647, 460, 643, 666, 595

After Situation:

After EQIP contract approval, participant has obtained services from a certified Technical Service Provider (TSP) for development of the Prescribed Burning Conservation Activity Plan (CAP). The CAP criteria require the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Prescribed Burning Plan CAP is not considered a Forest Management Plan, a Reforestation Plan, a Forest Harvest Plan, or a Prescribed Grazing Plan, but should complement the needs of those plans if they exist and if desired by the decision maker. The CAP plan will fully describe all aspects of the prescribed burn including, but not limited to objectives of the burn (i.e., site preparation, wildlife habitat, etc.), site conditions (i.e., fuel load, fuel type, etc.), implementation strategies (i.e., method of ignition, number of persons required, equipment needs, etc.), tolerable weather parameters (i.e., wind direction, relative humidity, mixing height, etc.) and identification of Smoke Sensitive Areas. Additional CAP plan criteria are detailed in the Field Office Technical Guide and potentially state developed technical criteria.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $610.08

Scenario Cost/Unit: $610.08

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, forester	1302	Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage.	Hours	$76.26	8	$610.08

Practice: 112 - Prescribed Burning Plan - Written

Scenario: #75 - Prescribed Burning Plan 101-250 Acres

Scenario Description:

Non Industrial Private Forest Land, Pasture or Range Land typically 101 to 250 acres in size and is dominated by fire tolerant species that are competing with undesirable vegetation and accumulating fuel load. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition.

Before Situation:

Producer has no existing plan or an obsolete plan that is insufficient for current stand condition. Due to the size, landscape position, low to moderate fuel loads and presence of both natural firebreaks (i.e., streams, lakes, etc.) and man-made firebreaks (i.e., roads, farm paths, agricultural fields, etc.), few newly constructed firebreaks are needed to implement the prescribed burn. A Prescribed Burning Plan or Conservation Activity Plan is needed to enable the producer to apply for financial assistance through EQIP or other financial assistance programs in order to implement needed conservation practices. Associated Practices: 394, 383, 384, 528, 314, 315, 550, 644, 645, 659, 342, 647, 460, 643, 666, 595

After Situation:

After EQIP contract approval, participant has obtained services from a certified Technical Service Provider (TSP) for development of the Prescribed Burning Conservation Activity Plan (CAP). The CAP criteria require the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Prescribed Burning Plan CAP is not considered a Forest Management Plan, a Reforestation Plan, a Forest Harvest Plan, or a Prescribed Grazing Plan, but should complement the needs of those plans if they exist and if desired by the decision maker. The CAP plan will fully describe all aspects of the prescribed burn including, but not limited to objectives of the burn (i.e., site preparation, wildlife habitat, etc.), site conditions (i.e., fuel load, fuel type, etc.), implementation strategies (i.e., method of ignition, number of persons required, equipment needs, etc.), tolerable weather parameters (i.e., wind direction, relative humidity, mixing height, etc.) and identification of Smoke Sensitive Areas. Additional CAP plan criteria are detailed in the Field Office Technical Guide and potentially state developed technical criteria.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $915.12

Scenario Cost/Unit: $915.12

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, forester	1302	Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage.	Hours	$76.26	12	$915.12

Practice: 112 - Prescribed Burning Plan - Written

Scenario: #76 - Prescribed Burning Plan 251-500 Acres

Scenario Description:

Non Industrial Private Forest Land, Pasture or Range Land typically 251 to 500 acres in size and is dominated by fire tolerant species that are competing with undesirable vegetation and accumulating fuel load. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition.

Before Situation:

Producer has no existing plan or an obsolete plan that is insufficient for current stand condition. Due to the size, landscape position, low to moderate fuel loads and presence of both natural firebreaks (i.e., streams, lakes, etc.) and man-made firebreaks (i.e., roads, farm paths, agricultural fields, etc.), few newly constructed firebreaks are needed to implement the prescribed burn. A Prescribed Burning Plan or Conservation Activity Plan is needed to enable the producer to apply for financial assistance through EQIP or other financial assistance programs in order to implement needed conservation practices. Associated Practices: 394, 383, 384, 528, 314, 315, 550, 644, 645, 659, 342, 647, 460, 643, 666, 595

After Situation:

After EQIP contract approval, participant has obtained services from a certified Technical Service Provider (TSP) for development of the Prescribed Burning Conservation Activity Plan (CAP). The CAP criteria require the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Prescribed Burning Plan CAP is not considered a Forest Management Plan, a Reforestation Plan, a Forest Harvest Plan, or a Prescribed Grazing Plan, but should complement the needs of those plans if they exist and if desired by the decision maker. The CAP plan will fully describe all aspects of the prescribed burn including, but not limited to objectives of the burn (i.e., site preparation, wildlife habitat, etc.), site conditions (i.e., fuel load, fuel type, etc.), implementation strategies (i.e., method of ignition, number of persons required, equipment needs, etc.), tolerable weather parameters (i.e., wind direction, relative humidity, mixing height, etc.) and identification of Smoke Sensitive Areas. Additional CAP plan criteria are detailed in the Field Office Technical Guide and potentially state developed technical criteria.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $1,220.16

Scenario Cost/Unit: $1,220.16

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, forester	1302	Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage.	Hours	$76.26	16	$1,220.16

Practice: 112 - Prescribed Burning Plan - Written

Scenario: #77 - Prescribed Burning Plan 501-1000 Acres

Scenario Description:

Non Industrial Private Forest Land, Pasture or Range Land typically 501 to 1000 acres in size and is dominated by fire tolerant species that are competing with undesirable vegetation and accumulating fuel load. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition.

Before Situation:

Producer has no existing plan or an obsolete plan that is insufficient for current stand condition. Due to the size, landscape position, low to moderate fuel loads and presence of both natural firebreaks (i.e., streams, lakes, etc.) and man-made firebreaks (i.e., roads, farm paths, agricultural fields, etc.), few newly constructed firebreaks are needed to implement the prescribed burn. A Prescribed Burning Plan or Conservation Activity Plan is needed to enable the producer to apply for financial assistance through EQIP or other financial assistance programs in order to implement needed conservation practices. Associated Practices: 394, 383, 384, 528, 314, 315, 550, 644, 645, 659, 342, 647, 460, 643, 666, 595

After Situation:

After EQIP contract approval, participant has obtained services from a certified Technical Service Provider (TSP) for development of the Prescribed Burning Conservation Activity Plan (CAP). The CAP criteria require the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Prescribed Burning Plan CAP is not considered a Forest Management Plan, a Reforestation Plan, a Forest Harvest Plan, or a Prescribed Grazing Plan, but should complement the needs of those plans if they exist and if desired by the decision maker. The CAP plan will fully describe all aspects of the prescribed burn including, but not limited to objectives of the burn (i.e., site preparation, wildlife habitat, etc.), site conditions (i.e., fuel load, fuel type, etc.), implementation strategies (i.e., method of ignition, number of persons required, equipment needs, etc.), tolerable weather parameters (i.e., wind direction, relative humidity, mixing height, etc.) and identification of Smoke Sensitive Areas. Additional CAP plan criteria are detailed in the Field Office Technical Guide and potentially state developed technical criteria.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $1,525.20

Scenario Cost/Unit: $1,525.20

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, forester	1302	Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage.	Hours	$76.26	20	$1,525.20

Practice: 112 - Prescribed Burning Plan - Written

Scenario: #78 - Prescribed Burning Plan Greater Than 1000 Acres

Scenario Description:

Non Industrial Private Forest Land, Pasture or Range Land typically greater than 1000 acres in size and is dominated by fire tolerant species that are competing with undesirable vegetation and accumulating fuel load. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition.

Before Situation:

Producer has no existing plan or an obsolete plan that is insufficient for current stand condition. Due to the size, landscape position, low to moderate fuel loads and presence of both natural firebreaks (i.e., streams, lakes, etc.) and man-made firebreaks (i.e., roads, farm paths, agricultural fields, etc.), few newly constructed firebreaks are needed to implement the prescribed burn. A Prescribed Burning Plan or Conservation Activity Plan is needed to enable the producer to apply for financial assistance through EQIP or other financial assistance programs in order to implement needed conservation practices. Associated Practices: 394, 383, 384, 528, 314, 315, 550, 644, 645, 659, 342, 647, 460, 643, 666, 595

After Situation:

After EQIP contract approval, participant has obtained services from a certified Technical Service Provider (TSP) for development of the Prescribed Burning Conservation Activity Plan (CAP). The CAP criteria require the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Prescribed Burning Plan CAP is not considered a Forest Management Plan, a Reforestation Plan, a Forest Harvest Plan, or a Prescribed Grazing Plan, but should complement the needs of those plans if they exist and if desired by the decision maker. The CAP plan will fully describe all aspects of the prescribed burn including, but not limited to objectives of the burn (i.e., site preparation, wildlife habitat, etc.), site conditions (i.e., fuel load, fuel type, etc.), implementation strategies (i.e., method of ignition, number of persons required, equipment needs, etc.), tolerable weather parameters (i.e., wind direction, relative humidity, mixing height, etc.) and identification of Smoke Sensitive Areas. Additional CAP plan criteria are detailed in the Field Office Technical Guide and potentially state developed technical criteria.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $1,830.24

Scenario Cost/Unit: $1,830.24

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, forester	1302	Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage.	Hours	$76.26	24	$1,830.24

Practice: 114 - Integrated Pest Management Plan - Written

Scenario: #41 - IPM Management CAP Small-Specialty Less Than 50 Acres

Scenario Description:

Various on-farm land uses where pests are managed on smaller operations, including organic and specialty crop operations, where more complicated pest management evaluations and solutions may be necessary. Current pest control activities cause environmental concerns with water quality and/or erosion. Natural Resource Concern: Water quality and all other appropriate resource concerns.

Before Situation:

Producer has no plan or limited knowledge of the control or management of agricultural pests. The producer currently manages pests based upon pesticide label instructions, personal knowledge, or other local criteria. Producer is interested in the management of pests and the reduction of environmental impacts for environmental benefit. Producer is willing to collaborate with a certified TSP to develop a plan and collect/coordinate data recording to monitor per requirements of the plan. Associated Practices: Integrated Pest Management, Crop Rotation, Cover Crop, Field Border, Filter Strip, Stripcropping, and Residue and Tillage management practices, or other applicable conservation practices cited in the NRCS Field Office Technical Guide.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Integrated Pest Management Conservation Activity Plan (CAP). The CAP criteria requires the plan to meet quality criteria for applicable resource concerns and provides for opportunities to utilize the following strategies: Prevention, Avoidance, Monitoring, and Suppression, which will be implemented through the use of Integrated Pest Management and may use one or more conservation practices and/or risk reduction strategies. The CAP plan may include recommendations for associated conservation practices which address other related resource concerns. The CAP meets the basic quality criteria for the 114 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $2,007.25

Scenario Cost/Unit: $2,007.25

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hours	$80.29	25	$2,007.25

Practice: 114 - Integrated Pest Management Plan - Written

Scenario: #42 - IPM Management CAP Medium 51 - 250 Acres

Scenario Description:

Various on-farm land uses where pests are managed on a moderately-sized farm where IPM is to be applied. Current pest control activities cause environmental concerns with water quality and/or erosion. Natural Resource Concern: Water quality and all other appropriate resource concerns.

Before Situation:

Producer has no plan or limited knowledge of the control or management of agricultural pests. The producer currently manages pests based upon pesticide label instructions, personal knowledge, or other local criteria. Producer is interested in the management of pests and the reduction of environmental impacts for environmental benefit. Producer is willing to collaborate with a certified TSP to develop a plan and collect/coordinate data recording to monitor per requirements of the plan. Associated Practices: Integrated Pest Management, Crop Rotation, Cover Crop, Field Border, Filter Strip, Stripcropping, and Residue and Tillage management practices, or other applicable conservation practices cited in the NRCS Field Office Technical Guide.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Integrated Pest Management Conservation Activity Plan (CAP). The CAP criteria requires the plan to meet quality criteria for applicable resource concerns and provides for opportunities to utilize the following strategies: Prevention, Avoidance, Monitoring, and Suppression, which will be implemented through the use of Integrated Pest Management and may use one or more conservation practices and/or risk reduction strategies. The CAP plan may include recommendations for associated conservation practices which address other related resource concerns. The CAP meets the basic quality criteria for the 114 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $2,569.28

Scenario Cost/Unit: $2,569.28

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hours	$80.29	32	$2,569.28

Practice: 114 - Integrated Pest Management Plan - Written

Scenario: #43 - IPM Management CAP Large - Greater Than 250 Acres

Scenario Description:

Various on-farm land uses where pests are managed on a larger farm where IPM strategies are to be applied. Current pest control activities cause environmental concerns with water quality and/or erosion. Natural Resource Concern: Water quality and all other appropriate resource concerns.

Before Situation:

Producer has no plan or limited knowledge of the control or management of agricultural pests. The producer currently manages pests based upon pesticide label instructions, personal knowledge, or other local criteria. Producer is interested in the management of pests and the reduction of environmental impacts for environmental benefit. Producer is willing to collaborate with a certified TSP to develop a plan and collect/coordinate data recording to monitor per requirements of the plan. Associated Practices: Integrated Pest Management, Crop Rotation, Cover Crop, Field Border, Filter Strip, Stripcropping, and Residue and Tillage management practices, or other applicable conservation practices cited in the NRCS Field Office Technical Guide.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Integrated Pest Management Conservation Activity Plan (CAP). The CAP criteria requires the plan to meet quality criteria for applicable resource concerns and provides for opportunities to utilize the following strategies: Prevention, Avoidance, Monitoring, and Suppression, which will be implemented through the use of Integrated Pest Management and may use one or more conservation practices and/or risk reduction strategies. The CAP plan may include recommendations for associated conservation practices which address other related resource concerns. The CAP meets the basic quality criteria for the 114 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $4,014.50

Scenario Cost/Unit: $4,014.50

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hours	$80.29	50	$4,014.50

Practice: 116 - Soil Health Management Plan - Written

Scenario: #12 - Small Farm

Scenario Description:

Evaluate soil health concerns and develop a transitional cropping management plan to improve overall soil health and address all 4 soil health principles. The plan includes management activities or land management practices associated with crop and forage production on smaller diversified farms (<10 acres).. The soil health management plan ensures that the purposes of crop and forage production and preservation of natural resources related to soil health are compatible.

Before Situation:

Agricultural producer has been farming a system that has not addressed all 4 of the soil health principles. Producer has noticed yield declines, soil degradation, or is simply interested in learning more about soil health management. Producer is willing to collaborate with a certified TSP to develop a plan.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP to develop the Soil Health Management CAP. The CAP identifies resource concerns and practices that will address all 4 soil health principles. The CAP meets the criteria for the 116 plan as cited in the NRCS Field Office

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $2,408.70

Scenario Cost/Unit: $2,408.70

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hours	$80.29	30	$2,408.70

Practice: 116 - Soil Health Management Plan - Written

Scenario: #28 - Crops and Livestock

Scenario Description:

Evaluate soil health concerns and develop a transitional cropping management plan to improve overall soil health and address all 4 soil health principles. The plan includes management activities or land management practices associated with crop, forage and livestock production. The soil health management plan ensures that the purposes of crop and forage production and preservation of natural resources related to soil health are compatible.

Before Situation:

Agricultural producer has been farming a system that has not addressed all 4 of the soil health principles. Producer has noticed yield declines, soil degradation, or is simply interested in learning more about soil health management. Producer is willing to collaborate with a certified TSP to develop a plan.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP to develop the Soil Health Management CAP. The CAP identifies resource concerns and practices that will address all 4 soil health principles. The CAP meets the criteria for the 116 plan as cited in the NRCS Field Office

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $4,014.50

Scenario Cost/Unit: $4,014.50

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hours	$80.29	50	$4,014.50

Practice: 116 - Soil Health Management Plan - Written

Scenario: #44 - Organic Crops and Livestock

Scenario Description:

Evaluate soil health concerns and develop a transitional cropping management plan to improve overall soil health and address all 4 soil health principles. The plan includes management activities or land management practices associated with crop, forage and livestock production on organic or transitioning to organic operations. The soil health management plan ensures that the purposes of crop and forage production and preservation of natural resources related to soil health are compatible.

Before Situation:

Agricultural producer has been farming a system that has not addressed all 4 of the soil health principles. Producer has noticed yield declines, soil degradation, or is simply interested in learning more about soil health management. Producer is willing to collaborate with a certified TSP to develop a plan.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP to develop the Soil Health Management CAP. The CAP identifies resource concerns and practices that will address all 4 soil health principles. The CAP meets the criteria for the 116 plan as cited in the NRCS Field Office

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $4,415.95

Scenario Cost/Unit: $4,415.95

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hours	$80.29	55	$4,415.95

Practice: 116 - Soil Health Management Plan - Written

Scenario: #60 - Organic Crops

Scenario Description:

Evaluate soil health concerns and develop a transitional cropping management plan to improve overall soil health and address all 4 soil health principles. The plan includes management activities or land management practices associated with crop and forage production on organic or transitioning to organic operations. The soil health management plan ensures that the purposes of crop and forage production and preservation of natural resources related to soil health are compatible.

Before Situation:

Agricultural producer has been farming a system that has not addressed all 4 of the soil health principles. Producer has noticed yield declines, soil degradation, or is simply interested in learning more about soil health management. Producer is willing to collaborate with a certified TSP to develop a plan.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP to develop the Soil Health Management CAP. The CAP identifies resource concerns and practices that will address all 4 soil health principles. The CAP meets the criteria for the 116 plan as cited in the NRCS Field Office.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $3,613.05

Scenario Cost/Unit: $3,613.05

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hours	$80.29	45	$3,613.05

Practice: 116 - Soil Health Management Plan - Written

Scenario: #76 - Crops

Scenario Description:

Evaluate soil health concerns and develop a transitional cropping management plan to improve overall soil health and address all 4 soil health principles. The plan includes management activities or land management practices associated with crop and forage production. The soil health management plan ensures that the purposes of crop and forage production and preservation of natural resources related to soil health are compatible.

Before Situation:

Agricultural producer has been farming a system that has not addressed all 4 of the soil health principles. Producer has noticed yield declines, soil degradation, or is simply interested in learning more about soil health management. Producer is willing to collaborate with a certified TSP to develop a plan.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP to develop the Soil Health Management CAP. The CAP identifies resource concerns and practices that will address all 4 soil health principles. The CAP meets the criteria for the 116 plan as cited in the NRCS Field Office

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $3,211.60

Scenario Cost/Unit: $3,211.60

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hours	$80.29	40	$3,211.60

Practice: 118 - Irrigation Water Management Plan - Written

Scenario: #15 - Irrigation Water Management Conservation Activity Plan CAP

Scenario Description:

Agricultural operations supported with existing irrigation systems. Natural Resource Concern: Water quantity and all other appropriate resource concerns.

Before Situation:

Producer has no plan or limited knowledge for management of water application to meet crop needs and address identified resource concerns. The producer currently manages water application based upon personal knowledge, or other local criteria. Producer is interested in management of irrigation water to maximize yields, improve profit margins, reduce costs, and for environmental benefit. Producer is willing to collaborate with a certified TSP to develop a plan and collect/coordinate data recording to monitor per requirements of plan. Associated Practices: Irrigation Water Management (449); Irrigation System (442); Irrigation System, Surface & Subsurface (443); Irrigation Pipeline (430); Irrigation Ditch Lining (428); Irrigation Field Ditch (388); Irrigation Canal or Lateral (320); Structure for Water Control (587); Irrigation Reservoir (436); Irrigation System, Tailwater Recovery (447); Pumping Plant (533); Irrigation Land Leveling (464); Anionic Polyacrylamide (PM) Application (450); Salinity and Sodic Soil Management (590); Nutrient Management (590); Waste Utilization (633); or other applicable conservation practices in the NRCS Field Office Technical Guide.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Irrigation Water Management Conservation Activity Plan (CAP) to control the volume, frequency, and rate of water for efficient irrigation and to address other resource concerns. The CAP criteria requires the plan to meet quality criteria for applicable resource concerns. The CAP plan may include recommendations for associated conservation practices which address other related resource concerns. The CAP meets the basic quality criteria for the 118 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $3,625.30

Scenario Cost/Unit: $3,625.30

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$103.58	35	$3,625.30

Practice: 118 - Irrigation Water Management Plan - Written

Scenario: #17 - Irrigation Water Management CAP with Pump Test

Scenario Description:

Agricultural operations supported with existing irrigation systems. Natural Resource Concern: Water quantity and all other appropriate resource concerns.

Before Situation:

Producer has no plan or limited knowledge for management of water application to meet crop needs and address identified resource concerns. The producer currently manages water application based upon personal knowledge, or other local criteria. The pump for the irrigation system is of unknown performance and older than 3 years. Producer is interested in management of irrigation water to maximize yields, improve profit margins, reduce costs, and for environmental benefit. Producer is willing to collaborate with a certified TSP to develop a plan and collect/coordinate data recording to monitor per requirements of the plan. Associated Practices: Irrigation Water Management (449); Irrigation System (442); Irrigation System, Surface & Subsurface (443); Irrigation Pipeline (430); Irrigation Ditch Lining (428); Irrigation Field Ditch (388); Irrigation Canal or Lateral (320); Structure for Water Control (587); Irrigation Reservoir (436); Irrigation System, Tailwater Recovery (447); Pumping Plant (533); Irrigation Land Leveling (464); Anionic Polyacrylamide (PM) Application (450); Salinity and Sodic Soil Management (590); Nutrient Management (590); Waste Utilization (633); or other applicable conservation practices in the NRCS Field Office Technical Guide.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for the development of the Irrigation Water Management Conservation Activity Plan (CAP) to control the volume, frequency, and rate of water for efficient irrigation and to address other resource concerns. Because a pump test was performed, a new pump that operates more efficiently and matches the irrigation system has been analyzed and could possibly be installed such that less water and energy are consumed. The CAP criteria requires the plan to meet quality criteria for applicable resource concerns. The CAP plan may include recommendations for associated conservation practices which address other related resource concerns. CAP meets the basic quality criteria for the 118 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: Acre

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $5,696.90

Scenario Cost/Unit: $5,696.90

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$103.58	55	$5,696.90

Practice: 128 - Agricultural Energy Management Plan - Written

Scenario: #1 - AgEMP Small, One Enterprise

Scenario Description:

Typical operation has either < 300 acres, < 300 AU, up to 2 irrigation pumps, < 20,000 sq. ft. of heater greenhouse, or a maple syrup enterprise. One enterprise as defined in the ASABE S612 Standard on-farm energy audit standard. A small operation is as described above. Agricultural producer currently has minimal knowledge of and no plan for energy conservation. The producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. Natural Resource Concern: Energy Conservation

Before Situation:

Producer currently has minimal knowledge of and no plan for energy conservation. The producer currently manages a small operation as described above. Producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Lighting System Improvement, 672 Building Envelope Improvement, or other applicable practices approved in the NRCS Field Office Technical Guide.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Agricultural Energy Management Plan. The CAP criteria requires the plan to meet quality criteria for energy conservation and efficiency. The CAP plan may include recommendations for associated conservation practices which address energy conservation. The CAP meets the basic quality criteria for the 128 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $2,404.16

Scenario Cost/Unit: $2,404.16

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$103.58	9	$932.22
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.12	17	$767.04
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hours	$29.77	1.5	$44.66
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hours	$55.02	12	$660.24

Practice: 128 - Agricultural Energy Management Plan - Written

Scenario: #3 - AgEMP Large, One Enterprise

Scenario Description:

Typical operation has either > 2,500 acres, > 1000 AU, more than 7 irrigation pumps, or > 40,001 sq. ft. of heater greenhouse. One enterprise as defined in the ASABE S612 Standard on-farm energy audit standard in combination with a large operation with one enterprise, one of which is described above. Agricultural producer currently has minimal knowledge of and no plan for energy conservation. The producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. Natural Resource Concern: Energy Conservation.

Before Situation:

Producer currently has minimal knowledge of and no plan for energy conservation. The producer currently manages a large operation with enterprises as described above. The producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Lighting System Improvement, 672 Building Envelope Improvement, or other applicable practices approved in the NRCS Field Office Technical Guide.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Agricultural Energy Management Plan. The CAP criteria requires the plan to meet quality criteria for energy conservation and efficiency. The CAP plan may include recommendations for associated conservation practices which address energy conservation. The CAP meets the basic quality criteria for the 128 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $3,935.21

Scenario Cost/Unit: $3,935.21

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$103.58	19	$1,968.02
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.12	20	$902.40
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hours	$29.77	2.5	$74.43
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hours	$55.02	18	$990.36

Practice: 128 - Agricultural Energy Management Plan - Written

Scenario: #12 - AgEMP 128 Large, Four Enterprise

Scenario Description:

Typical operation has either > 2,500 acres, > 1000 AU, more than 7 irrigation pumps, or > 40,001 sq. ft. of heater greenhouse. Four enterprises as defined in the ASABE S612 Standard on-farm energy audit standard in combination with a large livestock operation, one of which is described above. Multiple irrigation systems or a mixture of irrigation types may be counted as one of the extra enterprises. Agricultural producer currently has minimal knowledge of and no plan for energy conservation. The producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. Natural Resource Concern: Energy Conservation.

Before Situation:

Producer currently has minimal knowledge of and no plan for energy conservation. An Agricultural Energy Management CAP for any type of livestock operation with two non-livestock enterprises (complex or multiple irrigation systems can count as one of the extra enterprises) will be planned according to the ASABE S612 Standard (e.g., broiler and greenhouse). Producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. Associated Practices: 449 Irrigation Water Management, 374 Farmstead Energy Improvement, 670 Lighting System Improvement, 672 Building Envelope Improvement, or other applicable practices approved in the NRCS Field Office Technical Guide.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Agricultural Energy Management Plan. The CAP criteria requires the plan to meet quality criteria for energy conservation and efficiency. The CAP plan may include recommendations for associated conservation practices which address energy conservation. The CAP meets the basic quality criteria for the 128 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $8,641.00

Scenario Cost/Unit: $8,641.00

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$103.58	44	$4,557.52
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.12	32	$1,443.84
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hours	$29.77	5.5	$163.74
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hours	$55.02	45	$2,475.90

Practice: 128 - Agricultural Energy Management Plan - Written

Scenario: #174 - AgEMP Medium, Three Enterprise

Scenario Description:

Typical operation has either 301 to 2500 acres, 301 to 1000 AU, 3 to 6 Irrigation Pumps, or 20,001 to 40,000 sq. ft. heated greenhouse. Three enterprises as defined in the ASABE S612 Standard on-farm energy audit standard in combination with a medium operation, one of which is described above. Agricultural producer currently has minimal knowledge of and no plan for energy conservation. The producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. Natural Resource Concern: Energy Conservation.

Before Situation:

Producer currently has minimal knowledge of and no plan for energy conservation. An Agricultural Energy Management CAP for any type of operation with three enterprises will be planned according to the ASABE S612 Standard (e.g., broiler and greenhouse). The producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Lighting System Improvement, 672 Building Envelope Improvement, or other applicable practices approved in the NRCS Field Office Technical Guide.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Agricultural Energy Management Plan. The CAP criteria requires the plan to meet quality criteria for energy conservation and efficiency. The CAP plan may include recommendations for associated conservation practices which address energy conservation. The CAP meets the basic quality criteria for the 128 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $5,648.80

Scenario Cost/Unit: $5,648.80

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$103.58	24	$2,485.92
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.12	26	$1,173.12
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hours	$29.77	4	$119.08
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hours	$55.02	34	$1,870.68

Practice: 128 - Agricultural Energy Management Plan - Written

Scenario: #175 - AgEMP Medium, One Enterprise

Scenario Description:

Typical operation has either 301 to 2500 acres, 301 to 1000 AU, 3 to 6 Irrigation Pumps, or 20,001 to 40,000 sq. ft. heated greenhouse. One enterprise as defined in the ASABE S612 Standard on-farm energy audit standard in combination with a medium operation, one of which is described above. Agricultural producer currently has minimal knowledge of and no plan for energy conservation. The producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. Natural Resource concern: Energy Conservation

Before Situation:

Producer currently has minimal knowledge of and no plan for energy conservation. Producer currently manages a medium small operation with enterprise described above. The producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Lighting System Improvement, 672 Building Envelope Improvement or other applicable practices approved in the NRCS Field Office Technical Guide.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Agricultural Energy Management Plan. The CAP criteria requires the plan to meet quality criteria for energy conservation and efficiency. The CAP plan may include recommendations for associated conservation practices which address energy conservation. The CAP meets the basic quality criteria for the 128 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $2,994.98

Scenario Cost/Unit: $2,994.98

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$103.58	12	$1,242.96
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.12	18	$812.16
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hours	$29.77	2	$59.54
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hours	$55.02	16	$880.32

Practice: 128 - Agricultural Energy Management Plan - Written

Scenario: #176 - AgEMP Small, Two Enterprise

Scenario Description:

Typical operation has either <300 acres, < 300 AU, up to 2 irrigation pumps, or < 20,000 sq. ft. heated greenhouse. Two enterprises as defined in the ASABE S612 Standard on-farm energy audit standard. A small operation as described above. Agricultural producer currently has minimal knowledge of and no plan for energy conservation. The producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. Natural Resource Concern: Energy Conservation

Before Situation:

Producer currently has minimal knowledge of and no plan for energy conservation. An Agricultural Energy Management CAP for any type small sized operation with two enterprises will be planned according to the ASABE S612 Standard (e.g., broiler and greenhouse). The producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Lighting System Improvement, 672 Building Envelope Improvement, or other applicable practices approved in the NRCS Field Office Technical Guide.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Agricultural Energy Management Plan. The CAP criteria requires the plan to meet quality criteria for energy conservation and efficiency. The CAP plan may include recommendations for associated conservation practices which address energy conservation. The CAP meets the basic quality criteria for the 128 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $3,731.07

Scenario Cost/Unit: $3,731.07

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$103.58	15	$1,553.70
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.12	21	$947.52
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hours	$29.77	2.5	$74.43
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hours	$55.02	21	$1,155.42

Practice: 128 - Agricultural Energy Management Plan - Written

Scenario: #178 - AgEMP Medium Two Enterprises

Scenario Description:

Typical operation has either 301 to 2500 acres, 301 to 1000 AU, 3 to 6 Irrigation Pumps, or 20,001 to 40,000 sq. ft. heated greenhouse. Two enterprises as defined in the ASABE S612 Standard on-farm energy audit standard in combination with a medium operation, one of which is described above. Agricultural producer currently has minimal knowledge of and no plan for energy conservation. Producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. Natural Resource concern: Energy Conservation

Before Situation:

Producer currently has minimal knowledge of and no plan for energy conservation. An Agricultural Energy Management CAP for any operation with two enterprises will be planned according to the ASABE S612 Standard (e.g., broiler and greenhouse). Producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Lighting System Improvement, 672 Building Envelope Improvement, or other applicable practices approved in the NRCS Field Office Technical Guide.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Agricultural Energy Management Plan. The CAP criteria requires the plan to meet quality criteria for energy conservation and efficiency. The CAP plan may include recommendations for associated conservation practices which address energy conservation. The CAP meets the basic quality criteria for the 128 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $5,057.98

Scenario Cost/Unit: $5,057.98

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$103.58	21	$2,175.18
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.12	25	$1,128.00
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hours	$29.77	3.5	$104.20
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hours	$55.02	30	$1,650.60

Practice: 128 - Agricultural Energy Management Plan - Written

Scenario: #179 - AgEMP Large, Two Enterprises

Scenario Description:

Typical operation has either > 2,500 acres, > 1000 AU, more than 7 irrigation pumps, or > 40,001 sq. ft. of heater greenhouse. Two enterprises as defined in the ASABE S612 Standard on-farm energy audit standard in combination with a large operation, one of which is described above. Multiple irrigation systems or a mixture of irrigation types may be counted as one of the extra enterprises. Agricultural producer currently has minimal knowledge of and no plan for energy conservation. the producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. Natural Resource concern: Energy Conservation

Before Situation:

Producer currently has minimal knowledge of and no plan for energy conservation. An Agricultural Energy Management CAP for any operation with two enterprises (complex or multiple irrigation systems can count as one of the extra enterprises) will be planned according to the ASABE S612 Standard (e.g., broiler and greenhouse). The producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. An EMP is developed to assist an owner/operator in meeting all applicable local, tribal, State, and Federal water quality goals or regulations. Associated Practices: 449 Irrigation Water Management, 374 Farmstead Energy Improvement, 670 Lighting System Improvement, 672 Building Envelope Improvement, or other applicable practices approved in the NRCS Field Office Technical Guide.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Agricultural Energy Management Plan. The CAP criteria requires the plan to meet quality criteria for energy conservation and efficiency. The CAP plan may include recommendations for associated conservation practices which address energy conservation. The CAP meets the basic quality criteria for the 128 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $6,902.79

Scenario Cost/Unit: $6,902.79

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$103.58	32	$3,314.56
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.12	29	$1,308.48
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hours	$29.77	4.5	$133.97
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hours	$55.02	39	$2,145.78

Practice: 128 - Agricultural Energy Management Plan - Written

Scenario: #180 - AgEMP Small, Three Enterprise

Scenario Description:

Typical operation has either < 300 acres, < 300 AU, up to 2 irrigation pumps, or < 20,000 sq. ft. of heater greenhouse. Three enterprises as defined in the ASABE S612 Standard on-farm energy audit standard in combination with a small operation, one of which is described above. Agricultural producer currently has minimal knowledge of and no plan for energy conservation. The producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. Natural Resource Concern: Energy Conservation

Before Situation:

Producer currently has minimal knowledge of and no plan for energy conservation. An Agricultural Energy Management CAP for any type of operation with three enterprises will be planned according to the ASABE S612 Standard (e.g., broiler and greenhouse). The producer is willing to collaborate with a certified TSP to develop an AgEMP 122 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Lighting System Improvement, 672 Building Envelope Improvement, or other applicable practices approved in the NRCS Field Office Technical Guide.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Agricultural Energy Management Plan. The CAP criteria requires the plan to meet quality criteria for energy conservation and efficiency. The CAP plan may include recommendations for associated conservation practices which address energy conservation. The CAP meets the basic quality criteria for the 128 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $4,321.89

Scenario Cost/Unit: $4,321.89

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$103.58	18	$1,864.44
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.12	22	$992.64
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hours	$29.77	3	$89.31
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hours	$55.02	25	$1,375.50

Practice: 128 - Agricultural Energy Management Plan - Written

Scenario: #184 - AgEMP Large, Three Enterprise

Scenario Description:

Typical operation has either > 2,500 acres, > 1000 AU, more than 7 irrigation pumps, or > 40,001 sq. ft. of heater greenhouse. Three enterprises as defined in the ASABE S612 Standard on-farm energy audit standard in combination with a large operation, one of which is described above. Multiple irrigation systems or a mixture of irrigation types may be counted as one of the extra enterprises. Agricultural producer currently has minimal knowledge of and no plan for energy conservation. The producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. Natural Resource Concern: Energy Conservation.

Before Situation:

Producer currently has minimal knowledge of and no plan for energy conservation. An Agricultural Energy Management CAP for any type operation with three enterprises (complex or multiple irrigation systems can count as one of the extra enterprises) will be planned according to the ASABE S612 Standard (e.g., broiler and greenhouse). The producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. Associated Practices: 449 Irrigation Water Management, 374 Farmstead Energy Improvement, 670 Lighting System Improvement, 672 Building Envelope Improvement, or other applicable practices approved in the NRCS Field Office Technical Guide.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Agricultural Energy Management Plan. The CAP criteria requires the plan to meet quality criteria for energy conservation and efficiency. The CAP plan may include recommendations for associated conservation practices which address energy conservation. The CAP meets the basic quality criteria for the 128 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $7,597.19

Scenario Cost/Unit: $7,597.19

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$103.58	36	$3,728.88
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.12	30	$1,353.60
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hours	$29.77	5	$148.85
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hours	$55.02	43	$2,365.86

Practice: 128 - Agricultural Energy Management Plan - Written

Scenario: #185 - AgEMP Small, Four Enterprises

Scenario Description:

Typical operation has either < 300 acres, < 300 AU, up to 2 irrigation pumps, or < 20,000 sq. ft. of heater greenhouse. Four enterprises as defined in the ASABE S612 Standard on-farm energy audit standard in combination with a small operation, one of which is described above. Agricultural producer currently has minimal knowledge of and no plan for energy conservation. The producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. Natural Resource Concern: Energy Conservation.

Before Situation:

Producer currently has minimal knowledge of and no plan for energy conservation. An Agricultural Energy Management CAP for any operation with four enterprises will be planned according to the ASABE S612 Standard (e.g., broiler and greenhouse). the producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Lighting System Improvement, 672 Building Envelope Improvement, or other applicable practices approved in the NRCS Field Office Technical Guide.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Agricultural Energy Management Plan. The CAP criteria requires the plan to meet quality criteria for energy conservation and efficiency. The CAP plan may include recommendations for associated conservation practices which address energy conservation. The CAP meets the basic quality criteria for the 128 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $5,262.12

Scenario Cost/Unit: $5,262.12

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$103.58	25	$2,589.50
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.12	24	$1,082.88
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hours	$29.77	3.5	$104.20
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hours	$55.02	27	$1,485.54

Practice: 128 - Agricultural Energy Management Plan - Written

Scenario: #186 - AgEMP 128 Medium, Four Enterprise

Scenario Description:

Typical operation has either 301 to 2500 acres, 301 to 1000 AU, 3 to 6 Irrigation Pumps, or 20,001 to 40,000 sq. ft. heated greenhouse. Four enterprises as defined in the ASABE S612 Standard on-farm energy audit standard in combination with an medium operation, one of which is described above. Agricultural producer currently has minimal knowledge of and no plan for energy conservation. The producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. Natural Resource Concern: Energy Conservation.

Before Situation:

Producer currently has minimal knowledge of and no plan for energy conservation. An Agricultural Energy Management CAP for any type of operation with four or more enterprises will be planned according to the ASABE S612 Standard (e.g., broiler and greenhouse). The producer is willing to collaborate with a certified TSP to develop an AgEMP 122 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Lighting System Improvement, 672 Building Envelope Improvement, or other applicable practices approved in the NRCS Field Office Technical Guide.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Agricultural Energy Management Plan. The CAP criteria requires the plan to meet quality criteria for energy conservation and efficiency. The CAP plan may include recommendations for associated conservation practices which address energy conservation. The CAP meets the basic quality criteria for the 128 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $6,589.03

Scenario Cost/Unit: $6,589.03

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$103.58	31	$3,210.98
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.12	28	$1,263.36
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hours	$29.77	4.5	$133.97
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hours	$55.02	36	$1,980.72

Practice: 130 - Drainage Water Management Plan - Written

Scenario: #27 - DWMP - Tile Map Available

Scenario Description:

A Drainage Water Management Plan (DWMP) will be developed on a relatively flat crop field with a patterned drainage system where a map of the tile system is available. The DWMP will document soil, topographic, and drainage system maps of the site, and identify the number and location of water control structures that are needed to implement drainage water management according to Field Office Technical Guide standards. The DWMP will also provide guidelines for management of the water control structures to achieve desired resource outcomes.

Before Situation:

Producer has no plan for or knowledge of managing drainage water. The producer does not manage the field for the purpose of controlling water retention during the crop season and therefore crop yields are reduced. Existing ditches and/or tile drains on the cropland field currently conduct flow off field to waterways resulting in potential water quality resource concerns related to excessive nitrogen.

After Situation:

A certified Technical Service Provider (TSP) develops the Drainage Water Management Conservation Activity Plan (CAP). The DWMP documents soil, topographic, and drainage system maps of the site, and identifies the number and location of water control structures that are needed to implement drainage water management according to Field Office Technical Guide standards. The DWMP also provides guidelines for management of the water control structures to achieve desired resource outcomes. The plan is ready for implementation with structural measures and management once the structures are installed. No actual benefits to resource concerns are achieved until the practices in the DWMP are implemented.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $2,827.56

Scenario Cost/Unit: $2,827.56

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, small surveying crew	1296	Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. Cost associated with this component includes two man field crew, equipment, vehicle, overhead, and miscellaneous supplies.	Hours	$112.21	8	$897.68
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$78.84	13	$1,024.92
Cap Labor, Survey and Mapping Technician	1591	Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. May verify accuracy and completeness of maps.	Hours	$56.56	16	$904.96

Practice: 130 - Drainage Water Management Plan - Written

Scenario: #28 - DWMP - No Tile Map Available

Scenario Description:

A Drainage Water Management Plan (DWMP) will be developed on a relatively flat crop field with a patterned drainage system where no map of the tile system is available. The DWMP will document soil, topographic, and drainage system maps of the site, and identify the number and location of water control structures that are needed to implement drainage water management according to Field Office Technical Guide standards. The DWMP will also provide guidelines for management of the water control structures to achieve desired resource outcomes.

Before Situation:

Producer has no plan for or knowledge of managing drainage water. The producer does not manage the field for the purpose of controlling water retention during the crop season and therefore crop yields are reduced. Existing ditches and/or tile drains on the cropland field currently conduct flow off field to waterways resulting in potential water quality resource concerns related to excessive nitrogen.

After Situation:

A certified Technical Service Provider (TSP) develops the Drainage Water Management Conservation Activity Plan (CAP). The DWMP documents soil, topographic, and drainage system maps of the site, and identifies the number and location of water control structures that are needed to implement drainage water management according to Field Office Technical Guide standards. The DWMP also provides guidelines for management of the water control structures to achieve desired resource outcomes. The plan is ready for implementation with structural measures and management once the structures are installed. No actual benefits to resource concerns are achieved until the practices in the DWMP are implemented.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $3,930.60

Scenario Cost/Unit: $3,930.60

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, small surveying crew	1296	Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. Cost associated with this component includes two man field crew, equipment, vehicle, overhead, and miscellaneous supplies.	Hours	$112.21	8	$897.68
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$78.84	13	$1,024.92
Cap Labor, Survey and Mapping Technician	1591	Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. May verify accuracy and completeness of maps.	Hours	$56.56	16	$904.96
CAP Labor, Skilled	1604	Conservation Activity Plan labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.47	32	$1,103.04

Practice: 136 - Agricultural Energy Design Plan - Written

Scenario: #12 - AgEDP Low Complexity, One Design

Scenario Description:

An agricultural producer wishes to conserve energy through an EQIP contract with at least one (1) energy practice scenario. Associated scenario(s) provide for one-to-one device retrofits. The scenario(s) may provide for a new component to modify the operation of an existing device (e.g., timer to reduce run-time). Three factors typically indicate a “Low Complexity” system, as follows. 1) New devices maintain output (hp, Btu/hr, lux, etc.) of the old devices within a roughly 10% range. 2) New devices are installed in the same location as the old devices. 3) The retrofit does not require substantive changes to electrical, mechanical, plumbing, or structural systems. “Low Complexity” practice scenarios include but are not limited to: lamp or fixture upgrades; attic insulation; fans; or washer-extractors. “One Design” indicates that each new device or component is closely related to other devices or components even if numerous scenarios are contracted. The AgEDP includes reviewing, and, when needed, revising alternatives to address energy concerns. The AgEDP documents: a) the client’s final decisions related to the associated energy practice scenarios, b) estimated energy and greenhouse gas benefits; and c) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern: Energy Efficiency.

Before Situation:

Producer wants to transition their agricultural operation to become more energy efficient. Producer intends to work with a certified TSP to develop an AgEDP (CAP 136) to implement one or more practice scenarios to address the Energy Efficiency resource concerns. An AgEDP incorporates recommended measures to increase energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Lighting System Improvement, 672 Building Envelope Improvement, 533 Pumping Plant, or other applicable practices in the NRCS Field Office Technical Guide.

After Situation:

The producer has obtained services from a certified TSP to develop the Agricultural Energy Design Plan. The CAP 136 criteria include tasks needed to document the client’s decision, energy savings and design of conservation practices which address energy efficiency. The AgEDP meets the quality criteria for the CAP 136 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $2,785.57

Scenario Cost/Unit: $2,785.57

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$103.58	18	$1,864.44
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.12	10	$451.20
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hours	$29.77	1	$29.77
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hours	$55.02	8	$440.16

Practice: 136 - Agricultural Energy Design Plan - Written

Scenario: #28 - AgEDP Medium Complexity, One Design

Scenario Description:

An agricultural producer wishes to conserve energy through an EQIP contract with at least one (1) energy practice scenario. Associated scenario(s) provide for retrofits that impose some variables in the design process. The scenarios may involve a change in service levels that can be evaluated or designed through use of simple tools or manual calculations. Four factors typically indicate a “Medium Complexity” system, as follows. 1) Client objectives require a change of output (hp, Btu/hr, lux, etc.) that varies more than about 10% from old devices. 2) System constraints prevent new devices from being installed in the same location as the old devices. 3) The retrofit requires substantive changes to either electrical, mechanical, plumbing, or structural systems. 4) Analysis beyond the scope of NRCS methodology to evaluate alternatives is required to confirm level of service and appropriate device output, placement, etc. (For example, a simplified heat transfer model to determine heating, ventilation, and cooling loads may be required if existing device capacity cannot be estimated.) “Medium Complexity” practice scenarios include but are not limited to: change of lighting fixture counts or layout; wall insulation; grain dryers; add reverse osmosis to syrup production; or add evaporative cooling systems (cooling cells). “One Design” indicates that each new device or component is closely related to other devices or components even if numerous scenarios are contracted. The AgEDP includes reviewing, and, when needed, revising alternatives to address energy concerns. The AgEDP documents: a) the client’s final decisions related to the associated energy practice scenarios, b) estimated energy and greenhouse gas benefits; and c) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern: Energy Efficiency.

Before Situation:

Producer wants to transition their agricultural operation to become more energy efficient. Producer intends to work with a certified TSP to develop an AgEDP (CAP 136) to implement one or more practice scenarios to address the Energy Efficiency resource concerns. An AgEDP incorporates recommended measures to increase energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Lighting System Improvement, 672 Building Envelope Improvement, 533 Pumping Plant, or other applicable practices in the NRCS Field Office Technical Guide.

After Situation:

The producer has obtained services from a certified TSP to develop the Agricultural Energy Design Plan. The CAP 136 criteria include tasks needed to document the client’s decision, energy savings and design of conservation practices which address energy efficiency. The AgEDP meets the quality criteria for the CAP 136 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $4,213.46

Scenario Cost/Unit: $4,213.46

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$103.58	30	$3,107.40
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.12	11	$496.32
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hours	$29.77	2	$59.54
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hours	$55.02	10	$550.20

Practice: 136 - Agricultural Energy Design Plan - Written

Scenario: #44 - AgEDP High Complexity, One Design

Scenario Description:

An agricultural producer wishes to conserve energy through an EQIP contract with at least one (1) energy practice scenario. Associated scenario(s) provide for retrofits that impose several variables in the design process. The scenarios may involve a change in service levels that cannot be evaluated or designed through use of simple tools or manual calculations. Four factors typically indicate a “High Complexity” system, as follows. 1) Client objectives require a change of output (hp, Btu/hr, lux, etc.) that varies more than about 30% from old devices. 2) System constraints prevent new devices from being installed in the same location as the old devices. 3) The retrofit requires substantive changes to two or more of the electrical, mechanical, plumbing, or structural systems. 4) Complex analysis to evaluate alternatives is required to confirm level of service and appropriate device output, placement, etc. (For example, a detailed simulation is required to determine systems sizing and layout.) “High Complexity” practice scenarios include but are not limited to: comprehensive lighting system redesign; radiant heating systems; convert to tunnel ventilation; or convert to bench heating. “One Design” indicates that each new device or component is closely related to other devices or components even if numerous scenarios are contracted. The AgEDP includes reviewing, and, when needed, revising alternatives to address energy concerns. The AgEDP documents: a) the client’s final decisions related to the associated energy practice scenarios, b) estimated energy and greenhouse gas benefits; and c) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern: Energy Efficiency.

Before Situation:

Producer wants to transition their agricultural operation to become more energy efficient. Producer intends to work with a certified TSP to develop an AgEDP (CAP 136) to implement one or more practice scenarios to address the Energy Efficiency resource concerns. An AgEDP incorporates recommended measures to increase energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Lighting System Improvement, 672 Building Envelope Improvement, 533 Pumping Plant, or other applicable practices in the NRCS Field Office Technical Guide.

After Situation:

The producer has obtained services from a certified TSP to develop the Agricultural Energy Design Plan. The CAP 136 criteria include tasks needed to document the client’s decision, energy savings and design of conservation practices which address energy efficiency. The AgEDP meets the quality criteria for the CAP 136 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $5,641.35

Scenario Cost/Unit: $5,641.35

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$103.58	42	$4,350.36
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.12	12	$541.44
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hours	$29.77	3	$89.31
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hours	$55.02	12	$660.24

Practice: 136 - Agricultural Energy Design Plan - Written

Scenario: #60 - AgEDP Low Complexity, 2-3 Designs

Scenario Description:

An agricultural producer wishes to conserve energy through an EQIP contract with multiple energy practice scenarios. Associated scenario(s) provide for one-to-one device retrofits. The scenario(s) may provide for a new component to modify the operation of an existing device (e.g., timer to reduce run-time). Three factors typically indicate a "Low Complexity" system, as follows. 1) New devices maintain output (hp, Btu/hr, lux, etc.) of the old devices within a roughly 10% range. 2) New devices are installed in the same location as the old devices. 3) The retrofit does not require substantive changes to electrical, mechanical, plumbing, or structural systems. "Low Complexity" practice scenarios include but are not limited to: lamp or fixture upgrades; attic insulation; fans; or washer-extractors. Each "Design" indicates that new devices or components are closely related to other devices or components even if numerous scenarios are contracted. If more than one practice is contracted, then, at a minimum, "2-3 Designs" shall be contracted for the AgEDP. The AgEDP includes reviewing, and, when needed, revising alternatives to address energy concerns. The AgEDP documents: a) the client's final decisions related to the associated energy practice scenarios, b) estimated energy and greenhouse gas benefits; and c) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern: Energy Efficiency.

Before Situation:

Producer wants to transition their agricultural operation to become more energy efficient. Producer intends to work with a certified TSP to develop an AgEDP (CAP 136) to implement one or more practice scenarios to address the Energy Efficiency resource concerns. An AgEDP incorporates recommended measures to increase energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Lighting System Improvement, 672 Building Envelope Improvement, 533 Pumping Plant, or other applicable practices in the NRCS Field Office Technical Guide.

After Situation:

The producer has obtained services from a certified TSP to develop the Agricultural Energy Design Plan. The CAP 136 criteria include tasks needed to document the client's decision, energy savings and design of conservation practices which address energy efficiency. The AgEDP meets the quality criteria for the CAP 136 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $4,323.50

Scenario Cost/Unit: $4,323.50

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$103.58	30	$3,107.40
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.12	11	$496.32
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hours	$29.77	2	$59.54
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hours	$55.02	12	$660.24

Practice: 136 - Agricultural Energy Design Plan - Written

Scenario: #76 - AgEDP Medium Complexity, 2-3 Designs

Scenario Description:

An agricultural producer wishes to conserve energy through an EQIP contract with multiple energy practice scenarios. Associated scenario(s) provide for retrofits that impose some variables in the design process. The scenarios may involve a change in service levels that can be evaluated or designed through use of simple tools or manual calculations. Four factors typically indicate a “Medium Complexity” system, as follows. 1) Client objectives require a change of output (hp, Btu/hr, lux, etc.) that varies more than about 10% from old devices. 2) System constraints prevent new devices from being installed in the same location as the old devices. 3) The retrofit requires substantive changes to either electrical, mechanical, plumbing, or structural systems. 4) Analysis beyond the scope of NRCS methodology to evaluate alternatives is required to confirm level of service and appropriate device output, placement, etc. (For example, a simplified heat transfer model to determine heating, ventilation, and cooling loads may be required if existing device capacity cannot be estimated.) “Medium Complexity” practice scenarios include but are not limited to: change of lighting fixture counts or layout; wall insulation; grain dryers; add reverse osmosis to syrup production; or add evaporative cooling systems (cooling cells). Each “Design” indicates that new devices or components are closely related to other devices or components even if numerous scenarios are contracted. If more than one practice is contracted, then, at a minimum, “2-3 Designs” shall be contracted for the AgEDP. The AgEDP includes reviewing, and, when needed, revising alternatives to address energy concerns. The AgEDP documents: a) the client’s final decisions related to the associated energy practice scenarios, b) estimated energy and greenhouse gas benefits; and c) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern: Energy Efficiency.

Before Situation:

Producer wants to transition their agricultural operation to become more energy efficient. Producer intends to work with a certified TSP to develop an AgEDP (CAP 136) to implement one or more practice scenarios to address the Energy Efficiency resource concerns. An AgEDP incorporates recommended measures to increase energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Lighting System Improvement, 672 Building Envelope Improvement, 533 Pumping Plant, or other applicable practices in the NRCS Field Office Technical Guide.

After Situation:

The producer has obtained services from a certified TSP to develop the Agricultural Energy Design Plan. The CAP 136 criteria include tasks needed to document the client’s decision, energy savings and design of conservation practices which address energy efficiency. The AgEDP meets the quality criteria for the CAP 136 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $5,751.39

Scenario Cost/Unit: $5,751.39

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$103.58	42	$4,350.36
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.12	12	$541.44
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hours	$29.77	3	$89.31
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hours	$55.02	14	$770.28

Practice: 136 - Agricultural Energy Design Plan - Written

Scenario: #92 - AgEDP High Complexity, 2-3 Designs

Scenario Description:

An agricultural producer wishes to conserve energy through an EQIP contract with multiple energy practice scenarios. Associated scenario(s) provide for retrofits that impose several variables in the design process. The scenarios may involve a change in service levels that cannot be evaluated or designed through use of simple tools or manual calculations. Four factors typically indicate a “High Complexity” system, as follows. 1) Client objectives require a change of output (hp, Btu/hr, lux, etc.) that varies more than about 30% from old devices. 2) System constraints prevent new devices from being installed in the same location as the old devices. 3) The retrofit requires substantive changes to two or more of the electrical, mechanical, plumbing, or structural systems. 4) Complex analysis to evaluate alternatives is required to confirm level of service and appropriate device output, placement, etc. (For example, a detailed simulation is required to determine systems sizing and layout.) “High Complexity” practice scenarios include but are not limited to: comprehensive lighting system redesign; radiant heating systems; convert to tunnel ventilation; or convert to bench heating. Each “Design” indicates that new devices or components are closely related to other devices or components even if numerous scenarios are contracted. If more than one practice is contracted, then, at a minimum, “2-3 Designs” shall be contracted for the AgEDP The AgEDP includes reviewing, and, when needed, revising alternatives to address energy concerns. The AgEDP documents: a) the client’s final decisions related to the associated energy practice scenarios, b) estimated energy and greenhouse gas; and c) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern: Energy Efficiency.

Before Situation:

Producer wants to transition their agricultural operation to become more energy efficient. Producer intends to work with a certified TSP to develop an AgEDP (CAP 136) to implement one or more practice scenarios to address the Energy Efficiency resource concerns. An AgEDP incorporates recommended measures to increase energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Lighting System Improvement, 672 Building Envelope Improvement, 533 Pumping Plant, or other applicable practices in the NRCS Field Office Technical Guide.

After Situation:

The producer has obtained services from a certified TSP to develop the Agricultural Energy Design Plan. The CAP 136 criteria include tasks needed to document the client’s decision, energy savings and design of conservation practices which address energy efficiency. The AgEDP meets the quality criteria for the CAP 136 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $7,179.28

Scenario Cost/Unit: $7,179.28

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$103.58	54	$5,593.32
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.12	13	$586.56
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hours	$29.77	4	$119.08
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hours	$55.02	16	$880.32

Practice: 136 - Agricultural Energy Design Plan - Written

Scenario: #108 - AgEDP Low Complexity, 4-5 Designs

Scenario Description:

An agricultural producer wishes to conserve energy through an EQIP contract with multiple energy practice scenarios. Associated scenario(s) provide for one-to-one device retrofits. The scenario(s) may provide for a new component to modify the operation of an existing device (e.g., timer to reduce run-time). Three factors typically indicate a "Low Complexity" system, as follows. 1) New devices maintain output (hp, Btu/hr, lux, etc.) of the old devices within a roughly 10% range. 2) New devices are installed in the same location as the old devices. 3) The retrofit does not require substantive changes to electrical, mechanical, plumbing, or structural systems. "Low Complexity" practice scenarios include but are not limited to: lamp or fixture upgrades; attic insulation; fans; or washer-extractors. Each "Design" indicates that new devices or components are closely related to other devices or components even if numerous scenarios are contracted. If more than three practices are contracted, then, at a minimum, "4-5 Designs" shall be contracted for the AgEDP. The AgEDP includes reviewing, and, when needed, revising alternatives to address energy concerns. The AgEDP documents: a) the client's final decisions related to the associated energy practice scenarios, b) estimated energy and greenhouse gas benefits; and c) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern: Energy Efficiency.

Before Situation:

Producer wants to transition their agricultural operation to become more energy efficient. Producer intends to work with a certified TSP to develop an AgEDP (CAP 136) to implement one or more practice scenarios to address the Energy Efficiency resource concerns. An AgEDP incorporates recommended measures to increase energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Lighting System Improvement, 672 Building Envelope Improvement, 533 Pumping Plant, or other applicable practices in the NRCS Field Office Technical Guide.

After Situation:

The producer has obtained services from a certified TSP to develop the Agricultural Energy Design Plan. The CAP 136 criteria include tasks needed to document the client's decision, energy savings and design of conservation practices which address energy efficiency. The AgEDP meets the quality criteria for the CAP 136 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $5,861.43

Scenario Cost/Unit: $5,861.43

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$103.58	42	$4,350.36
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.12	12	$541.44
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hours	$29.77	3	$89.31
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hours	$55.02	16	$880.32

Practice: 136 - Agricultural Energy Design Plan - Written

Scenario: #124 - AgEDP Medium Complexity, 4-5 Designs

Scenario Description:

An agricultural producer wishes to conserve energy through an EQIP contract with multiple energy practice scenarios. Associated scenario(s) provide for retrofits that impose some variables in the design process. The scenarios may involve a change in service levels that can be evaluated or designed through use of simple tools or manual calculations. Four factors typically indicate a “Medium Complexity” system, as follows. 1) Client objectives require a change of output (hp, Btu/hr, lux, etc.) that varies more than about 10% from old devices. 2) System constraints prevent new devices from being installed in the same location as the old devices. 3) The retrofit requires substantive changes to either electrical, mechanical, plumbing, or structural systems. 4) Analysis beyond the scope of NRCS methodology to evaluate alternatives is required to confirm level of service and appropriate device output, placement, etc. (For example, a simplified heat transfer model to determine heating, ventilation, and cooling loads may be required if existing device capacity cannot be estimated.) “Medium Complexity” practice scenarios include but are not limited to: change of lighting fixture counts or layout; wall insulation; grain dryers; add reverse osmosis to syrup production; or add evaporative cooling systems (cooling cells). Each “Design” indicates that new devices or components are closely related to other devices or components even if numerous scenarios are contracted. If more than three practices are contracted, then, at a minimum, “4-5 Designs” shall be contracted for the AgEDP. The AgEDP includes reviewing, and, when needed, revising alternatives to address energy concerns. The AgEDP documents: a) the client’s final decisions related to the associated energy practice scenarios, b) estimated energy and greenhouse gas benefits; and c) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern: Energy Efficiency.

Before Situation:

Producer wants to transition their agricultural operation to become more energy efficient. Producer intends to work with a certified TSP to develop an AgEDP (CAP 136) to implement one or more practice scenarios to address the Energy Efficiency resource concerns. An AgEDP incorporates recommended measures to increase energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Lighting System Improvement, 672 Building Envelope Improvement, 533 Pumping Plant, or other applicable practices in the NRCS Field Office Technical Guide.

After Situation:

The producer has obtained services from a certified TSP to develop the Agricultural Energy Design Plan. The CAP 136 criteria include tasks needed to document the client’s decision, energy savings and design of conservation practices which address energy efficiency. The AgEDP meets the quality criteria for the CAP 136 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $7,289.32

Scenario Cost/Unit: $7,289.32

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$103.58	54	$5,593.32
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.12	13	$586.56
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hours	$29.77	4	$119.08
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hours	$55.02	18	$990.36

Practice: 136 - Agricultural Energy Design Plan - Written

Scenario: #140 - AgEDP High Complexity, 4-5 Designs

Scenario Description:

An agricultural producer wishes to conserve energy through an EQIP contract with multiple energy practice scenarios. Associated scenario(s) provide for retrofits that impose several variables in the design process. The scenarios may involve a change in service levels that cannot be evaluated or designed through use of simple tools or manual calculations. Four factors typically indicate a “High Complexity” system, as follows. 1) Client objectives require a change of output (hp, Btu/hr, lux, etc.) that varies more than about 30% from old devices. 2) System constraints prevent new devices from being installed in the same location as the old devices. 3) The retrofit requires substantive changes to two or more of the electrical, mechanical, plumbing, or structural systems. 4) Complex analysis to evaluate alternatives is required to confirm level of service and appropriate device output, placement, etc. (For example, a detailed simulation is required to determine systems sizing and layout.) “High Complexity” practice scenarios include but are not limited to: comprehensive lighting system redesign; radiant heating systems; convert to tunnel ventilation; or convert to bench heating. Each “Design” indicates that new devices or components are closely related to other devices or components even if numerous scenarios are contracted. If more than three practices are contracted, then, at a minimum, “4-5 Designs” shall be contracted for the AgEDP. The AgEDP includes reviewing, and, when needed, revising alternatives to address energy concerns. The AgEDP documents: a) the client’s final decisions related to the associated energy practice scenarios, b) estimated energy and greenhouse gas benefits; and c) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern: Energy Efficiency.

Before Situation:

Producer wants to transition their agricultural operation to become more energy efficient. Producer intends to work with a certified TSP to develop an AgEDP (CAP 136) to implement one or more practice scenarios to address the Energy Efficiency resource concerns. An AgEDP incorporates recommended measures to increase energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Lighting System Improvement, 672 Building Envelope Improvement, 533 Pumping Plant, or other applicable practices in the NRCS Field Office Technical Guide.

After Situation:

The producer has obtained services from a certified TSP to develop the Agricultural Energy Design Plan. The CAP 136 criteria include tasks needed to document the client’s decision, energy savings and design of conservation practices which address energy efficiency. The AgEDP meets the quality criteria for the CAP 136 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $8,717.21

Scenario Cost/Unit: $8,717.21

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$103.58	66	$6,836.28
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.12	14	$631.68
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hours	$29.77	5	$148.85
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hours	$55.02	20	$1,100.40

Practice: 136 - Agricultural Energy Design Plan - Written

Scenario: #156 - AgEDP Low Complexity, 6+ Designs

Scenario Description:

An agricultural producer wishes to conserve energy through an EQIP contract with multiple energy practice scenarios. Associated scenario(s) provide for one-to-one device retrofits. The scenario(s) may provide for a new component to modify the operation of an existing device (e.g., timer to reduce run-time). Three factors typically indicate a "Low Complexity" system, as follows. 1) New devices maintain output (hp, Btu/hr, lux, etc.) of the old devices within a roughly 10% range. 2) New devices are installed in the same location as the old devices. 3) The retrofit does not require substantive changes to electrical, mechanical, plumbing, or structural systems. "Low Complexity" practice scenarios include but are not limited to: lamp or fixture upgrades; attic insulation; fans; or washer-extractors. Each "Design" indicates that new devices or components are closely related to other devices or components even if numerous scenarios are contracted. If more than five practices are contracted, then, at a minimum, "6+ Designs" shall be contracted for the AgEDP. The AgEDP includes reviewing, and, when needed, revising alternatives to address energy concerns. The AgEDP documents: a) the client's final decisions related to the associated energy practice scenarios, b) estimated energy and greenhouse gas; and c) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern: Energy Efficiency.

Before Situation:

Producer wants to transition their agricultural operation to become more energy efficient. Producer intends to work with a certified TSP to develop an AgEDP (CAP 136) to implement one or more practice scenarios to address the Energy Efficiency resource concerns. An AgEDP incorporates recommended measures to increase energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Lighting System Improvement, 672 Building Envelope Improvement, 533 Pumping Plant, or other applicable practices in the NRCS Field Office Technical Guide.

After Situation:

The producer has obtained services from a certified TSP to develop the Agricultural Energy Design Plan. The CAP 136 criteria include tasks needed to document the client's decision, energy savings and design of conservation practices which address energy efficiency. The AgEDP meets the quality criteria for the CAP 136 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $7,399.36

Scenario Cost/Unit: $7,399.36

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$103.58	54	$5,593.32
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.12	13	$586.56
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hours	$29.77	4	$119.08
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hours	$55.02	20	$1,100.40

Practice: 136 - Agricultural Energy Design Plan - Written

Scenario: #172 - AgEDP Medium Complexity, 6+ Designs

Scenario Description:

An agricultural producer wishes to conserve energy through an EQIP contract with multiple energy practice scenarios. Associated scenario(s) provide for retrofits that impose some variables in the design process. The scenarios may involve a change in service levels that can be evaluated or designed through use of simple tools or manual calculations. Four factors typically indicate a “Medium Complexity” system, as follows. 1) Client objectives require a change of output (hp, Btu/hr, lux, etc.) that varies more than about 10% from old devices. 2) System constraints prevent new devices from being installed in the same location as the old devices. 3) The retrofit requires substantive changes to either electrical, mechanical, plumbing, or structural systems. 4) Analysis beyond the scope of NRCS methodology to evaluate alternatives is required to confirm level of service and appropriate device output, placement, etc. (For example, a simplified heat transfer model to determine heating, ventilation, and cooling loads may be required if existing device capacity cannot be estimated.) “Medium Complexity” practice scenarios include but are not limited to: change of lighting fixture counts or layout; wall insulation; grain dryers; add reverse osmosis to syrup production; or add evaporative cooling systems (cooling cells). Each “Design” indicates that new devices or components are closely related to other devices or components even if numerous scenarios are contracted. If more than five practices are contracted, then, at a minimum, “6+ Designs” shall be contracted for the AgEDP. The AgEDP includes reviewing, and, when needed, revising alternatives to address energy concerns. The AgEDP documents: a) the client’s final decisions related to the associated energy practice scenarios, b) estimated energy and greenhouse gas benefits; and c) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern: Energy Efficiency.

Before Situation:

Producer wants to transition their agricultural operation to become more energy efficient. Producer intends to work with a certified TSP to develop an AgEDP (CAP 136) to implement one or more practice scenarios to address the Energy Efficiency resource concerns. An AgEDP incorporates recommended measures to increase energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Lighting System Improvement, 672 Building Envelope Improvement, 533 Pumping Plant, or other applicable practices in the NRCS Field Office Technical Guide.

After Situation:

The producer has obtained services from a certified TSP to develop the Agricultural Energy Design Plan. The CAP 136 criteria include tasks needed to document the client’s decision, energy savings and design of conservation practices which address energy efficiency. The AgEDP meets the quality criteria for the CAP 136 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $8,827.25

Scenario Cost/Unit: $8,827.25

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$103.58	66	$6,836.28
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.12	14	$631.68
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hours	$29.77	5	$148.85
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hours	$55.02	22	$1,210.44

Practice: 136 - Agricultural Energy Design Plan - Written

Scenario: #188 - AgEDP High Complexity, 6+ Designs

Scenario Description:

An agricultural producer wishes to conserve energy through an EQIP contract with multiple energy practice scenarios. Associated scenario(s) provide for retrofits that impose several variables in the design process. The scenarios may involve a change in service levels that cannot be evaluated or designed through use of simple tools or manual calculations. Four factors typically indicate a “High Complexity” system, as follows. 1) Client objectives require a change of output (hp, Btu/hr, lux, etc.) that varies more than about 30% from old devices. 2) System constraints prevent new devices from being installed in the same location as the old devices. 3) The retrofit requires substantive changes to two or more of the electrical, mechanical, plumbing, or structural systems. 4) Complex analysis to evaluate alternatives is required to confirm level of service and appropriate device output, placement, etc. (For example, a detailed simulation is required to determine systems sizing and layout.) “High Complexity” practice scenarios include but are not limited to: comprehensive lighting system redesign; radiant heating systems; convert to tunnel ventilation; or convert to bench heating. Each “Design” indicates that new devices or components are closely related to other devices or components even if numerous scenarios are contracted. If more than five practices are contracted, then, at a minimum, “6+ Designs” shall be contracted for the AgEDP. The AgEDP includes reviewing, and, when needed, revising alternatives to address energy concerns. The AgEDP documents: a) the client’s final decisions related to the associated energy practice scenarios, b) estimated energy and greenhouse gas benefits; and c) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern: Energy Efficiency.

Before Situation:

Producer wants to transition their agricultural operation to become more energy efficient. Producer intends to work with a certified TSP to develop an AgEDP (CAP 136) to implement one or more practice scenarios to address the Energy Efficiency resource concerns. An AgEDP incorporates recommended measures to increase energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Lighting System Improvement, 672 Building Envelope Improvement, 533 Pumping Plant, or other applicable practices in the NRCS Field Office Technical Guide.

After Situation:

The producer has obtained services from a certified TSP to develop the Agricultural Energy Design Plan. The CAP 136 criteria include tasks needed to document the client’s decision, energy savings and design of conservation practices which address energy efficiency. The AgEDP meets the quality criteria for the CAP 136 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $10,255.14

Scenario Cost/Unit: $10,255.14

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$103.58	78	$8,079.24
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.12	15	$676.80
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hours	$29.77	6	$178.62
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hours	$55.02	24	$1,320.48

Practice: 138 - Conservation Plan Supporting Organic Transition - Written

Scenario: #28 - Conservation Plan Supporting Organic Transition CAP Crops and Livestock

Scenario Description:

Agricultural operation where producer will transition from conventional to organic to meet USDA National Organic Program (NOP) requirements. Natural Resource Concern: Soil Erosion, Water Quality, Plant Condition, and other identified natural resource concerns.

Before Situation:

Agricultural operation currently managed using traditional and conventional methods for farming and/or ranching mixed operation of crops and livestock. The producer currently manages the operation based upon personal knowledge, or other local criteria. The producer is interested in transitioning part or all of the management unit to meet national USDA requirements for a certified operation. The producer is willing to collaborate with a certified TSP to develop a plan and collect/coordinate data recording to monitor per requirements of plan. Associated Practices: Refer to the NRCS Plan Criteria for conservation practices associated with operations transitioning to organic certification and typically needed to address identified natural resource concerns.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP to develop the Conservation Plan Supporting Organic Transition Conservation Activity Plan (CAP) The CAP criteria requires the plan to meet quality criteria for applicable resource concerns and provides for opportunities to implement a system of conservation practices which assist the producer to transition from conventional farming or ranching to an organic production system with crops and livestock. The CAP plan will include conservation practices which address related resource concerns. The CAP meets the basic quality criteria for the 138 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $5,913.00

Scenario Cost/Unit: $5,913.00

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$78.84	75	$5,913.00

Practice: 138 - Conservation Plan Supporting Organic Transition - Written

Scenario: #29 - Conservation Plan Supporting Organic Transition CAP Crops or Livestock

Scenario Description:

Agricultural operation where producer will transition from conventional to organic to meet USDA National Organic Program (NOP) requirements. Natural Resource Concern: Soil Erosion, Water Quality, Plant Condition, and other identified natural resource concerns.

Before Situation:

Agricultural operation currently managed using traditional and conventional methods for farming with only crops. The producer currently manages the operation based upon personal knowledge, or other local criteria. The producer is interested in transitioning part or all of the management unit to meet national USDA requirements for certified operation. The producer is willing to collaborate with a certified TSP to develop a plan and collect/coordinate data recording to monitor per requirements of plan. Associated Practices: Refer to the NRCS Plan Criteria for conservation practices associated with operations transitioning to organic certification and typically needed to address identified natural resource concerns.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP to develop the Conservation Plan Supporting Organic Transition Conservation Activity Plan (CAP) The CAP criteria requires the plan to meet quality criteria for applicable resource concerns and provides for opportunities to implement a system of conservation practices which assist the producer to transition from conventional farming or ranching to an organic production system with crops and livestock. The CAP plan will include conservation practices which address related resource concerns. The CAP meets the basic quality criteria for the 138 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $5,045.76

Scenario Cost/Unit: $5,045.76

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$78.84	64	$5,045.76

Practice: 142 - Fish and Wildlife Habitat Plan - Written

Scenario: #28 - Fish & Wildlife Habitat Management CAP (2 Land Uses)

Scenario Description:

Various on-farm land uses. Natural Resource Concern: Fish and Wildlife, and other applicable resource concerns on an agricultural operation. The CAP addresses fish and wildlife habitat management relative to two land uses on the agricultural operation of which each land use is at least 20 acres in size.

Before Situation:

Producer has no plan or knowledge of development or management of fish and/or wildlife habitat. The producer does not currently manage or enhance habitat to promote opportunities for fish and/or wildlife habitat. Within existing land uses, the producer is interested in management of land or for establishment of new habitat for benefit of appropriate fish or wildlife species. Associated Practices: Applicable conservation practices cited in the CAP criteria and NRCS Field Office Technical Guide.

After Situation:

After EQIP contract approval, the participant has obtained services from a certified TSP for development of the Fish and Wildlife Management Conservation Activity Plan (CAP). The CAP criteria requires the plan to meet quality criteria for the primary fish/wildlife habitat resource concern and other applicable resource concerns and provides for opportunities to improve, restore, or enhance habitat that supports native and/or managed species. The CAP plan may include recommendations for associated conservation practices which address other related resource concerns. The CAP meets the basic quality criteria for the 142 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $3,523.08

Scenario Cost/Unit: $3,523.08

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, biologist	1298	Conservation Activity Plan labor to study the origins, behavior, diseases, genetics, and life processes of animals and wildlife. May specialize in wildlife research and management. May collect and analyze biological data to determine the environmental effects of present and potential use of land and water habitats. Cost associated with this component includes overhead and benefits (market price).	Hours	$80.07	44	$3,523.08

Practice: 142 - Fish and Wildlife Habitat Plan - Written

Scenario: #44 - Fish & Wildlife Habitat Management CAP (Three Land Uses)

Scenario Description:

Various on-farm land uses. Natural Resource Concern: Fish and Wildlife, and other applicable resource concerns on an agricultural operation. The CAP addresses fish and wildlife habitat management relative to two or more land uses on the agricultural operation of which at least three of the land uses are at least 20 acres in size

Before Situation:

Producer has no plan or knowledge of development or management of fish and/or wildlife habitat. The producer does not currently manage or enhance habitat to promote opportunities for fish and/or wildlife habitat. Within existing land uses, the producer is interested in management of land or for establishment of new habitat for benefit of appropriate fish or wildlife species. Associated Practices: Applicable conservation practices cited in the CAP criteria and NRCS Field Office Technical Guide.

After Situation:

After EQIP contract approval, the participant has obtained services from a certified TSP for development of the Fish and Wildlife Management Conservation Activity Plan (CAP). The CAP criteria requires the plan to meet quality criteria for the primary fish/wildlife habitat resource concern and other applicable resource concerns and provides for opportunities to improve, restore, or enhance habitat that supports native and/or managed species. The CAP plan may include recommendations for associated conservation practices which address other related resource concerns. The CAP meets the basic quality criteria for the 142 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $4,163.64

Scenario Cost/Unit: $4,163.64

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, biologist	1298	Conservation Activity Plan labor to study the origins, behavior, diseases, genetics, and life processes of animals and wildlife. May specialize in wildlife research and management. May collect and analyze biological data to determine the environmental effects of present and potential use of land and water habitats. Cost associated with this component includes overhead and benefits (market price).	Hours	$80.07	52	$4,163.64

Practice: 142 - Fish and Wildlife Habitat Plan - Written

Scenario: #60 - Fish & Wildlife Habitat Management CAP (1 Land Use)

Scenario Description:

Various on-farm land uses. Natural Resource Concern: Fish and Wildlife, and other applicable resource concerns on an agricultural operation. The CAP addresses fish and wildlife habitat management relative to only one land use on the agricultural operation.

Before Situation:

Producer has no plan or knowledge of development or management of fish and/or wildlife habitat. The producer does not currently manage or enhance habitat to promote opportunities for fish and/or wildlife habitat. Within existing land uses, the producer is interested in management of land or for establishment of new habitat for benefit of appropriate fish or wildlife species. Associated Practices: Applicable conservation practices cited in the CAP criteria and NRCS Field Office Technical Guide.

After Situation:

After EQIP contract approval, the participant has obtained services from a certified TSP for development of the Fish and Wildlife Management Conservation Activity Plan (CAP). The CAP criteria requires the plan to meet quality criteria for the primary fish/wildlife habitat resource concern and other applicable resource concerns and provides for opportunities to improve, restore, or enhance habitat that supports native and/or managed species. The CAP plan may include recommendations for associated conservation practices which address other related resource concerns. The CAP meets the basic quality criteria for the 142 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $2,882.52

Scenario Cost/Unit: $2,882.52

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, biologist	1298	Conservation Activity Plan labor to study the origins, behavior, diseases, genetics, and life processes of animals and wildlife. May specialize in wildlife research and management. May collect and analyze biological data to determine the environmental effects of present and potential use of land and water habitats. Cost associated with this component includes overhead and benefits (market price).	Hours	$80.07	36	$2,882.52

Practice: 146 - Pollinator Habitat Plan - Written

Scenario: #28 - Pollinator Habitat Enhancement Plan CAP

Scenario Description:

Various on-farm land uses. Natural Resource Concern: Fish and Wildlife, Plant Condition, Soil Erosion, Water Quality on an agricultural operation.

Before Situation:

Agricultural producer currently has no plan or knowledge of development or management of pollinator habitat. The producer does not currently manage or enhance habitat to promote opportunities for pollinator habitat. Within existing land uses, the producer may be interested in management of land or for establishment of new habitat for benefit of appropriate pollinator species. Associated Practices: 311, 322, 327, 328, 656, 332, 340, 342, 647, 386, 393, 412, 422, 603, 379, 512, 595, 338, 528, 550, 329, 643, 391, 390, 381, 395, 580, 585, 612, 645, 601, 659, 657, 644, 380, 650.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Pollinator Habitat Enhancement Conservation Activity Plan (CAP). The CAP criteria requires the plan to meet quality criteria for applicable resource concerns and provides for opportunities to improve, restore, or enhance flower-rich habitat that supports native and/or managed pollinator species. The CAP plan may include recommendations for associated conservation practices which address other related resource concerns. The CAP meets the basic quality criteria for the 146 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $3,362.94

Scenario Cost/Unit: $3,362.94

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, biologist	1298	Conservation Activity Plan labor to study the origins, behavior, diseases, genetics, and life processes of animals and wildlife. May specialize in wildlife research and management. May collect and analyze biological data to determine the environmental effects of present and potential use of land and water habitats. Cost associated with this component includes overhead and benefits (market price).	Hours	$80.07	42	$3,362.94

Practice: 146 - Pollinator Habitat Plan - Written

Scenario: #29 - Pollinator Habitat Enhancement Plan CAP - No Local TSP

Scenario Description:

Various on-farm land uses, No qualified TSP within 300 miles. Natural Resource Concern: Fish and Wildlife, Plant Condition, Soil Erosion, Water Quality on an agricultural operation.

Before Situation:

Agricultural producer currently has no plan or knowledge of development or management of pollinator habitat. The producer does not currently manage or enhance habitat to promote opportunities for pollinator habitat. Within existing land uses, the producer may be interested in management of land or for establishment of new habitat for benefit of appropriate pollinator species. Associated Practices: 311, 322, 327, 328, 656, 332, 340, 342, 647, 386, 393, 412, 422, 603, 379, 512, 595, 338, 528, 550, 329, 643, 391, 390, 381, 395, 580, 585, 612, 645, 601, 659, 657, 644, 380, 650.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Pollinator Habitat Enhancement Conservation Activity Plan (CAP). The CAP criteria requires the plan to meet quality criteria for applicable resource concerns and provides for opportunities to improve, restore, or enhance flower-rich habitat that supports native and/or managed pollinator species. The CAP plan may include recommendations for associated conservation practices which address other related resource concerns. The CAP meets the basic quality criteria for the 146 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $4,884.27

Scenario Cost/Unit: $4,884.27

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, biologist	1298	Conservation Activity Plan labor to study the origins, behavior, diseases, genetics, and life processes of animals and wildlife. May specialize in wildlife research and management. May collect and analyze biological data to determine the environmental effects of present and potential use of land and water habitats. Cost associated with this component includes overhead and benefits (market price).	Hours	$80.07	61	$4,884.27

Practice: 154 - IPM Herbicide Resistance Weed Conservation Plan - Written

Scenario: #3 - IPM Herbicide Resistance Weed Management CAP Large - Greater Than 250 Acres

Scenario Description:

On-farm cropland where weeds are resistant to herbicides, including organic and specialty crop operations. Natural Resource Concerns: Water quality, soil erosion, soil condition, and plant condition are the appropriate resource concerns.

Before Situation:

Agricultural producer currently has no plan or limited knowledge for management of cropland weeds or for adaptive techniques to address herbicide resistant weeds. The producer currently manages cropland weeds based upon herbicide label instructions, personal knowledge, or other local criteria, and has not implemented strategies to diversify crop rotations and rotate herbicide modes of action for purposes of managing resistant weed spread and protecting soil quality and plant condition. The producer is interested in the management of weeds to maximize yields, improve profit margins, reduce costs, address challenges in herbicide resistant weeds, and for environmental benefit. The producer is willing to collaborate with a certified TSP to develop a plan and collect/coordinate data recording to monitor per requirements of plan. Associated Practices: Integrated Pest Management, Crop Rotation, Cover Crop, Field Border, Filter Strip, Stripcropping, and Residue and Tillage management practices, or other application conservation practices cited tin the NRCS Field Office Technical Guide.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Herbicide Resistance Weed Conservation Activity Plan (CAP). The CAP criteria requires the plan to meet quality criteria for applicable resource concerns and provides for opportunities to utilize the following strategies: Prevention, Avoidance, Monitoring, and Suppression, which will be implemented through the use of Integrated Pest Management and may use one or more of the following conservation practices: Crop Rotation, Cover Crop, and Residue Management. Recommendations on crop system diversification and integration of herbicide mode of action rotation for effective weed control on recommended crop rotation are integral to the CAP. The CAP plan may include recommendations for associated conservation practices which address other related resource concerns. The CAP meets the basic quality criteria for the 154 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $4,817.40

Scenario Cost/Unit: $4,817.40

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hours	$80.29	60	$4,817.40

Practice: 154 - IPM Herbicide Resistance Weed Conservation Plan - Written

Scenario: #41 - IPM Herbicide Resistance Weed Management CAP Small-Specialty Less Than or Equal to 50 Acres

Scenario Description:

On-farm cropland where weeds are resistant to herbicides, including organic and specialty crop operations. Natural Resource Concerns: Water quality, soil erosion, soil condition, and plant condition are the appropriate resource concerns.

Before Situation:

Agricultural producer currently has no plan or limited knowledge for management of cropland weeds or for adaptive techniques to address herbicide resistant weeds. The producer currently manages cropland weeds based upon herbicide label instructions, personal knowledge, or other local criteria, and has not implemented strategies to diversify crop rotations and rotate herbicide modes of action for purposes of managing resistant weed spread and protecting soil quality and plant condition. The producer is interested in management of weeds to maximize yields, improve profit margins, reduce costs, address challenges in herbicide resistant weeds, and for environmental benefit. The producer is willing to collaborate with a certified TSP to develop a plan and collect/coordinate data recording to monitor per requirements of the plan. Associated Practices: Integrated Pest Management, Crop Rotation, Cover Crop, Field Border, Filter Strip, Stripcropping, and Residue and Tillage management practices, or other applicable conservation practices cited in the NRCS Field Office Technical Guide.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Herbicide Resistance Weed Conservation Activity Plan (CAP). The CAP criteria requires the plan to meet quality criteria for applicable resource concerns and provides for opportunities to utilize the following strategies: Prevention, Avoidance, Monitoring, and Suppression, which will be implemented through the use of Integrated Pest Management and may use one or more of the following conservation practices: Crop Rotation, Cover Crop, and Residue Management. Recommendations on crop system diversification and integration of herbicide mode of action rotation for effective weed control on recommended crop rotation are integral to the CAP. The CAP plan may include recommendations for associated conservation practices which address other related resource concerns. The CAP meets the basic quality criteria for the 154 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $2,408.70

Scenario Cost/Unit: $2,408.70

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hours	$80.29	30	$2,408.70

Practice: 154 - IPM Herbicide Resistance Weed Conservation Plan - Written

Scenario: #42 - IPM Herbicide Resistance Weed Management CAP Medium 51 - 250 Acres

Scenario Description:

On-farm cropland where weeds are resistant to herbicides, including organic and specialty crop operations. Natural Resource Concerns: Water quality, soil erosion, soil condition, and plant condition are the appropriate resource concerns.

Before Situation:

Agricultural producer currently has no plan or limited knowledge for management of cropland weeds or for adaptive techniques to address herbicide resistant weeds. The producer currently manages cropland weeds based upon herbicide label instructions, personal knowledge, or other local criteria, and has not implemented strategies to diversify crop rotations and rotate herbicide modes of action for purposes of managing resistant weed spread and protecting soil quality and plant condition. The producer is interested in management of weeds to maximize yields, improve profit margins, reduce costs, address challenges in herbicide resistant weeds, and for environmental benefit. The producer is willing to collaborate with a certified TSP to develop a plan and collect/coordinate data recording to monitor per requirements of the plan. Associated Practices: Integrated Pest Management, Crop Rotation, Cover Crop, Field Border, Filter Strip, Stripcropping, and Residue and Tillage management practices, or other applicable conservation practices cited in the NRCS Field Office Technical Guide.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Herbicide Resistance Weed Conservation Activity Plan (CAP). The CAP criteria requires the plan to meet quality criteria for applicable resource concerns and provides for opportunities to utilize the following strategies: Prevention, Avoidance, Monitoring, and Suppression, which will be implemented through the use of Integrated Pest Management and may use one or more of the following conservation practices: Crop Rotation, Cover Crop, and Residue Management. Recommendations on crop system diversification and integration of herbicide mode of action rotation for effective weed control on recommended crop rotation are integral to the CAP. The CAP plan may include recommendations for associated conservation practices which address other related resource concerns. The CAP meets the basic quality criteria for the 154 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $3,131.31

Scenario Cost/Unit: $3,131.31

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hours	$80.29	39	$3,131.31

Practice: 201 - Edge-of-Field Water Quality Monitoring-Data Collection and Evaluation

Scenario: #1 - Data Collect Surface Year 1 plus - NO QAPP

Scenario Description:

This practice scenario provides for the use of an edge-of-field WQ monitoring station(s) for surface run-off for one control and one treatment site. The scenario requires the collection and analysis of edge-of-field water quality data with an average sample collection of 20 per year per station, with each sample analyzed for 6 separate parameters (2 sites x 20 samples x 6 parameters = 240 total water quality tests). The data will be transferred through semi-annual submittal and annual report which include some preliminary annual analysis. This scenario will normally be used in year 1 to next to the last year of monitoring of the contract when a monitoring plan and QAPP will be not prepared as this is for an existing monitoring system that has been accepted as meeting both Activity 201 and 202. THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

Before Situation:

The agricultural operation prior to installing this practice will have an existing system for collecting water quality data but not have been operating with a long enough time frame to measure practice effectiveness.

After Situation:

This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual submittal, and annual report for one control and one treatment site. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP have been prepared as part of an existing monitoring system installation where the QAPP and monitoring plan meets Activity 201 requirements and no major changes are needed to meet Activity 202 requirements. The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201.

Feature Measure: Measuring Site

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $18,733.20

Scenario Cost/Unit: $18,733.20

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	130	$4,435.60
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	60	$6,672.60
Materials						
Testing, Blanks Samples	2612	Blanks or Duplicate Samples; Includes materials only.	Each	$31.25	4	$125.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	$31.25	240	$7,500.00

Practice: 201 - Edge-of-Field Water Quality Monitoring-Data Collection and Evaluation

Scenario: #139 - Data Collect Tile Year 1-QAPP

Scenario Description:

This practice scenario provides for the design and use of an edge-of-field WQ monitoring station(s) for tile and subsurface drainage run-off for one control and one treatment site with an average of 40 samples per year per station, with each sample analyzed for 6 separate parameters (2 sites x 40 samples x 6 parameters = 480 total water quality tests). A subsurface system also requires the addition of a surface sampling system at the same outlet to capture overland flow with 20 samples per year, with each sample analyzed for 6 separate parameters (2 sites x 20 samples x 6 parameters = 240 total water quality tests). Without the surface system then not all runoff is captured for calculating a true event mean concentration as per the 201 Standard. The scenario requires the creation of a survey to site a monitoring station, preparation of monitoring plan and a quality assurance project plan to detail how data will be collected, handled and analyzed, provides for the data collection, analysis, semiannual report, and annual report. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP need to be prepared prior to installation under Edge-of-Field Water Quality Monitoring - System Installation (202). THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

Before Situation:

The agricultural operation prior to installing this practice will not have a plan or quality assurance project plan prepared for installing equipment nor collecting data for sediment and nutrients leaving the edge of field.

After Situation:

This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual report, and annual report for one control and one treatment site. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP have been prepared prior to installation under Edge-of-Field Water Quality Monitoring - System Installation (202). The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201.

Feature Measure: Measuring Site

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $51,981.30

Scenario Cost/Unit: $51,981.30

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	312	$10,645.44
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	166	$18,460.86
Materials						
Testing, Blanks Samples	2612	Blanks or Duplicate Samples; Includes materials only.	Each	$31.25	12	$375.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	$31.25	720	$22,500.00

Practice: 201 - Edge-of-Field Water Quality Monitoring-Data Collection and Evaluation

Scenario: #146 - Data Collect Tile Year 1+ less QAPP (pre-install information) with two treatment sites

Scenario Description:

This practice scenario provides for the design and use of an edge-of-field WQ monitoring station(s) for tile and subsurface drainage run-off for one control and two treatment sites with an average of 40 samples per year per station, with each sample analyzed for 6 separate parameters (3 sites x 40 samples x 6 parameters = 720 total water quality tests). A subsurface system also requires the addition of a surface sampling system at the same outlet to capture overland flow with 20 samples per year, with each sample analyzed for 6 separate parameters (3 sites x 20 samples x 6 parameters = 360 total water quality tests). Without the surface system then not all runoff is captured for calculating a true event mean concentration as per the 201 Standard. The data will be transferred through semi-annual submittal and annual reports, which include some preliminary annual analysis. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP will not be prepared as this is for an existing monitoring system be accepted as meeting both Activity 201 and 202. THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

Before Situation:

The agricultural operation prior to installing this practice will have an existing system for collecting water quality data but not have been operating with a long enough time frame to measure practice effectiveness.

After Situation:

This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual submittal, and annual report for one control and two treatment sites. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP have been prepared as part of an existing monitoring system installation where the QAPP and monitoring plan meets Activity 201 requirements and no major changes are needed to meet Activity 202 requirements. The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201.

Feature Measure: Measuring site

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $61,745.53

Scenario Cost/Unit: $61,745.53

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	364	$12,419.68
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	135	$15,013.35
Materials						
Testing, Blanks Samples	2612	Blanks or Duplicate Samples; Includes materials only.	Each	$31.25	18	$562.50
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	$31.25	1080	$33,750.00

Practice: 201 - Edge-of-Field Water Quality Monitoring-Data Collection and Evaluation

Scenario: #153 - Data Collect Tile Year 1 plus - NO QAPP

Scenario Description:

This practice scenario provides for the design and use of an edge-of-field WQ monitoring station(s) for tile and subsurface drainage run-off for one control and one treatment site with an average of 40 samples per year per station, with each sample analyzed for 6 separate parameters (2 sites x 40 samples x 6 parameters = 480 total water quality tests). A subsurface system also requires the addition of a surface sampling system at the same outlet to capture overland flow with 20 samples per year, with each sample analyzed for 6 separate parameters (2 sites x 20 samples x 6 parameters = 240 total water quality tests). Without the surface system then not all runoff is captured for calculating a true event mean concentration as per the 201 Standard. The data will be transferred through semi-annual submittal and annual reports, which include some preliminary annual analysis. This scenario will normally be used in year 1 to next to the last year of monitoring of the contract when a monitoring plan and QAPP will be not prepared as this is for an existing monitoring system be accepted as meeting both Activity 201 and 202. THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

Before Situation:

The agricultural operation prior to installing this practice will have an existing system for collecting water quality data but not have been operating with a long enough time frame to measure practice effectiveness.

After Situation:

This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual submittal, and annual report for one control and one treatment site. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP have been prepared as part of an existing monitoring system installation where the QAPP and monitoring plan meets Activity 201 requirements and no major changes are needed to meet Activity 202 requirements. The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201.

Feature Measure: Measuring Site

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $43,529.34

Scenario Cost/Unit: $43,529.34

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	312	$10,645.44
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	90	$10,008.90
Materials						
Testing, Blanks Samples	2612	Blanks or Duplicate Samples; Includes materials only.	Each	$31.25	12	$375.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	$31.25	720	$22,500.00

Practice: 201 - Edge-of-Field Water Quality Monitoring-Data Collection and Evaluation

Scenario: #160 - Data Collect Tile Last Year with two treatment sites

Scenario Description:

This practice scenario provides for the design and use of an edge-of-field WQ monitoring station(s) for tile and subsurface drainage run-off for one control and two treatment sites with an average of 40 samples per year per station with each sample analyzed for 6 separate parameters (3 sites x 40 samples x 6 parameters = 720 total water quality tests). A subsurface system also requires the addition of a surface sampling system at the same outlet to capture overland flow with 20 samples per year with each sample analyzed for 6 separate parameters (3 sites x 20 samples x 6 parameters = 360 total water quality tests). Without the surface system then not all runoff is captured for calculating a true event mean concentration as per the 201 Standard. The scenario requires the collection and analysis of edge-of-field water quality data along with a comprehensive report to statistically prove relationship between select conservation practices and water quality. The data will be transferred through semi-annual submittal and annual report and a comprehensive report of practice effectiveness. This scenario will be used in the last year of monitoring. THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

Before Situation:

The agricultural operation prior to installing this practice will have an existing system for collecting water quality data but not have been operating with a long enough time frame to measure practice effectiveness.

After Situation:

This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual submittal, and annual report for one control and two treatment sites. The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201 to provide a comprehensive report of statistical testing of data collected during to complete monitoring period.

Feature Measure: Measuring site

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $68,418.13

Scenario Cost/Unit: $68,418.13

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	364	$12,419.68
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	195	$21,685.95
Materials						
Testing, Blanks Samples	2612	Blanks or Duplicate Samples; Includes materials only.	Each	$31.25	18	$562.50
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	$31.25	1080	$33,750.00

Practice: 201 - Edge-of-Field Water Quality Monitoring-Data Collection and Evaluation

Scenario: #167 - Data Collect Tile Last Year

Scenario Description:

This practice scenario provides for the design and use of an edge-of-field WQ monitoring station(s) for tile and subsurface drainage run-off for one control and one treatment site with an average of 40 samples per year per station, with each sample analyzed for 6 separate parameters (2 sites x 40 samples x 6 parameters = 480 total water quality tests). A subsurface system also requires the addition of a surface sampling system at the same outlet to capture overland flow with 20 samples per year, with each sample analyzed for 6 separate parameters (2 sites x 20 samples x 6 parameters = 240 total water quality tests). Without the surface system then not all runoff is captured for calculating a true event mean concentration as per the 201 Standard. The scenario requires the collection and analysis of edge-of-field water quality data along with a comprehensive report to statistically prove relationship between select conservation practices and water quality. The data will be transferred through semi-annual submittal and annual report and a comprehensive report of practice effectiveness. This scenario will be used in the last year of monitoring. THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

Before Situation:

The agricultural operation prior to installing this practice will have an existing system for collecting water quality data but not have been operating with a long enough time frame to measure practice effectiveness.

After Situation:

This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual submittal, and annual report for one control and one treatment site. The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201 to provide a comprehensive report of statistical testing of data collected during to complete monitoring period.

Feature Measure: Measuring site

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $47,977.74

Scenario Cost/Unit: $47,977.74

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	312	$10,645.44
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	130	$14,457.30
Materials						
Testing, Blanks Samples	2612	Blanks or Duplicate Samples; Includes materials only.	Each	$31.25	12	$375.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	$31.25	720	$22,500.00

Practice: 201 - Edge-of-Field Water Quality Monitoring-Data Collection and Evaluation

Scenario: #174 - Data Collect Surface Year 1-QAPP with two treatment Sites

Scenario Description:

This practice scenario provides for the design and use of an edge-of-field WQ monitoring station(s) for surface run-off for one control and two treatment sites with an average of 20 samples per year per station, with each sample analyzed for 6 separate parameters (3 sites x 20 samples x 6 parameters = 360 total water quality tests). The scenario requires the creation of a survey to site a monitoring station, preparation of monitoring plan and a quality assurance project plan to detail how data will be collected, handled and analyzed, provides for the data collection, analysis, semiannual report, and annual report. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP need to be prepared prior to installation under Edge-of-Field Water Quality Monitoring - System Installation (202). THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

Before Situation:

The agricultural operation prior to installing this practice will not have a plan or quality assurance project plan prepared for installing equipment nor collecting data for sediment and nutrients leaving the edge of field.

After Situation:

This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual report, and annual report for one control and one treatment site. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP have been prepared prior to installation under Edge-of-Field Water Quality Monitoring - System Installation (202). The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201.

Feature Measure: Measuring Sites

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $37,222.86

Scenario Cost/Unit: $37,222.86

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	156	$5,322.72
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	184	$20,462.64
Materials						
Testing, Blanks Samples	2612	Blanks or Duplicate Samples; Includes materials only.	Each	$31.25	6	$187.50
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	$31.25	360	$11,250.00

Practice: 201 - Edge-of-Field Water Quality Monitoring-Data Collection and Evaluation

Scenario: #181 - Data Collect Surface Year 1-QAPP

Scenario Description:

This practice scenario provides for the design and use of an edge-of-field WQ monitoring station(s) for surface run-off for one control and one treatment site with an average of 20 samples per year per station, with each sample analyzed for 6 separate parameters (2 sites x 20 samples x 6 parameters = 240 total water quality tests). The scenario requires the creation of a survey to site a monitoring station, preparation of monitoring plan and a quality assurance project plan to detail how data will be collected, handled and analyzed, provides for the data collection, analysis, semiannual report, and annual report. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP need to be prepared prior to installation under Edge-of-Field Water Quality Monitoring - System Installation (202). THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

Before Situation:

The agricultural operation prior to installing this practice will not have a plan or quality assurance project plan prepared for installing equipment nor collecting data for sediment and nutrients leaving the edge of field.

After Situation:

This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual report, and annual report for one control and one treatment site. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP have been prepared prior to installation under Edge-of-Field Water Quality Monitoring - System Installation (202). The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201.

Feature Measure: Measuring Sites

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $27,185.16

Scenario Cost/Unit: $27,185.16

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	130	$4,435.60
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	136	$15,124.56
Materials						
Testing, Blanks Samples	2612	Blanks or Duplicate Samples; Includes materials only.	Each	$31.25	4	$125.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	$31.25	240	$7,500.00

Practice: 201 - Edge-of-Field Water Quality Monitoring-Data Collection and Evaluation

Scenario: #190 - Data Collect Surface Year 1+ less QAPP (pre-install information) with two treatment sites

Scenario Description:

This practice scenario provides for the use of an edge-of-field WQ monitoring station(s) for surface run-off for one control and two treatment sites. The scenario requires the collection and analysis of edge-of-field water quality data with an average sample collection of 20 per year for each surface system, with each sample analyzed for 6 separate parameters (3 sites x 20 samples x 6 parameters = 360 total water quality tests). The data will be transferred through semi-annual submittal and annual report, which include some preliminary annual analysis. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP will not be prepared as this is for an existing monitoring system be accepted as meeting both Activity 201 and 202. THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

Before Situation:

The agricultural operation prior to installing this practice will have an existing system for collecting water quality data but not have been operating with a long enough time frame to measure practice effectiveness.

After Situation:

This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semi-annual submittal, and annual report for one control and two treatment sites. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP have been prepared as part of an existing monitoring system installation where the QAPP and monitoring plan meets Activity 201 requirements and no major changes are needed to meet Activity 202 requirements. The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201.

Feature Measure: Measuring site

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $26,769.12

Scenario Cost/Unit: $26,769.12

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	156	$5,322.72
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	90	$10,008.90
Materials						
Testing, Blanks Samples	2612	Blanks or Duplicate Samples; Includes materials only.	Each	$31.25	6	$187.50
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	$31.25	360	$11,250.00

Practice: 201 - Edge-of-Field Water Quality Monitoring-Data Collection and Evaluation

Scenario: #197 - Data Collect Surface Last Year

Scenario Description:

This practice scenario provides for the use of an edge-of-field WQ monitoring station(s) for surface run-off for one control and one treatment site with an average of 20 samples per year per station, with each sample analyzed for 6 separate parameters (2 sites x 20 samples x 6 parameters = 240 total water quality tests). The scenario requires the collection and analysis of edge-of-field water quality data along with a comprehensive report to statistically prove relationship between select conservation practices and water quality. The data will be transferred through semi-annual submittal and annual report and a comprehensive report of practice effectiveness. This scenario will be used in the last year of monitoring. THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

Before Situation:

The agricultural operation prior to installing this practice will have an existing system for collecting water quality data but not have been operating with a long enough time frame to measure practice effectiveness.

After Situation:

This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual submittal, and annual report for one control and one treatment site. The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201 to provide a comprehensive report of statistical testing of data collected to complete monitoring period.

Feature Measure: Measuring Site

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $23,181.60

Scenario Cost/Unit: $23,181.60

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	130	$4,435.60
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	100	$11,121.00
Materials						
Testing, Blanks Samples	2612	Blanks or Duplicate Samples; Includes materials only.	Each	$31.25	4	$125.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	$31.25	240	$7,500.00

Practice: 201 - Edge-of-Field Water Quality Monitoring-Data Collection and Evaluation

Scenario: #204 - Data Collect Surface Last Year with two treatment sites

Scenario Description:

This practice scenario provides for the use of an edge-of-field WQ monitoring station(s) for surface run-off for one control and two treatment sites with an average of 20 samples per year per station, with each sample analyzed for 6 separate parameters (3 sites x 20 samples x 6 parameters = 360 total water quality tests). The scenario requires the collection and analysis of edge-of-field water quality data along with a comprehensive report to statistically prove relationship between select conservation practices and water quality. The data will be transferred through semi-annual submittal and annual report and a comprehensive report of practice effectiveness. This scenario will be used in the last year of monitoring. THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

Before Situation:

The agricultural operation prior to installing this practice will have an existing system for collecting water quality data but not have been operating with a long enough time frame to measure practice effectiveness.

After Situation:

This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual submittal, and annual report for one control and two treatment sites. The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201 to provide a comprehensive report of statistical testing of data collected during to complete monitoring period.

Feature Measure: Measuring site

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $33,441.72

Scenario Cost/Unit: $33,441.72

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	156	$5,322.72
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	150	$16,681.50
Materials						
Testing, Blanks Samples	2612	Blanks or Duplicate Samples; Includes materials only.	Each	$31.25	6	$187.50
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration – Preferred, or Total Suspended Solids. Includes materials only.	Each	$31.25	360	$11,250.00

Practice: 202 - Edge-of-Field Water Quality Monitoring-System Installation

Scenario: #100 - System Installation-Tile Cold Climate

Scenario Description:

This edge-of-field water quality monitoring system is applicable to a single control or treatment site that has a field defined with tile or other subsurface drainage runoff that can be captured and sampled at the edge of a field before entering a ditch or receiving water body or water course. The component monitoring equipment are associated with a typical system for northern latitudes where winter time heating is required for sampling. It will allow for installation of automated sampling data collection system for a subsurface collection and separate surface automated sample collection system with protective housing to reduce potential for vandalism, battery backup for operation during periods when electricity is down or solar panels are not creating an electrical current, an area velocity sensor for pipe flow and estimation of submerged flow, a calf hut or other structure with heat is required over the flume to allow sampling under northern latitude winter conditions and a berm or other directional flow structure to guide the runoff to a sampling flume.

Before Situation:

The agricultural operation prior to installing the monitoring equipment is guessing about the effects of the conservation system with regards to meeting practice intent of avoid, controlling, or trapping sediment and nutrients. Nothing is known about the volume or mass of sediment and nutrients leaving the edge of field through the tile or other subsurface drainage system.

After Situation:

The agricultural operation after installing the monitoring equipment will be receiving feedback in the form of edge-of-field runoff water quality samples. The samples will allow the operator to understand the relationship between rain/irrigation, practice choice, and nutrient inputs effecting nutrient and sediment loss for the field. Thus, providing an opportunity to make adaptive management changes to the agricultural operation to reduce sediment and nutrient loss and/or profitability.

Feature Measure: System installed

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $31,108.53

Scenario Cost/Unit: $31,108.53

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	100	$3,412.00
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	6	$667.26
Materials						
Solar Panels, fixed cost portion	1031	Fixed cost portion of the Solar Panels. This portion is a base cost for all Solar Panels and is not dependant on KiloWatt. The total cost of any Solar Panels will include this fixed cost plus a variable cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drops and etc). This cost will include material, labor and equipment.	Each	$273.31	1	$273.31
Solar Panels, variable cost portion	1135	Variable cost portion of the Solar Panels. This portion IS dependent on the total Kilowatt for the Solar Panels. The total cost of any Solar Panels will include this variable cost plus the fixed cost portion. The completed Solar Panels will include all materials (electrical, controllers, and service drop, etc). This cost will include material, labor and equipment.	Kilowatt	$2,429.59	0.12	$291.55
Heater, high efficiency	1165	Natural gas, propane, or fuel oil unit heater or boiler and venting materials. Based on input kBTU/hour. Includes materials and shipping only.	1,000 BTU/Hour	$16.42	1	$16.42
Weather Station, Advanced	2550	Advance Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, temperature, and solar radiation from a solar powered self-standing tripod to an advance weather recording console. Used for both 449 advance irrigation water management and for Activity 202 water quality monitoring .	Each	$811.13	1	$811.13
Automated sampler with bottles and tubing	2606	Equipment used to collect the water samples on a flow weighted interval of 1.27 mm of runoff (volumetric depth) during a storm event.	Each	$2,139.41	2	$4,278.82
Connectors, cables, platform materials	2607	Miscellaneous (connectors, cables, berm, platform materials); Includes materials only.	Each	$9,207.20	1	$9,207.20
Depth (stage) sensor	2608	Device used to relay information to the Data logger about incremental increases in runoff. ISCO 730 Module with 1/8-in x 25-ft vinyl bubble line. Includes equipment only. Used for A202 water quality monitering	Each	$2,706.00	2	$5,412.00
Equipment shelter	2609	Building designed to house and reduce the risk of equipment damage from weather, animals, and vandalism.	Each	$1,036.93	2	$2,073.86

Pre-calibrated flow control structure-surface	2610	Pre-calibrated flow control structure-surface. Used for A202 water quality monitering	Each	$1,220.00	1	$1,220.00
Pre-calibrated flow control structure-subsurface (pipe flow)	2615	Equipment used to collect runoff for ease in measure of flow, sample collection and to reduce time in constructing and calibrating of a flow structure.	Each	$754.69	1	$754.69
Device, communications	2616	Piece of equipment or hardware designed to transmit real time data or information collected prior to site visits. Includes equipment only.	Each	$2,251.00	1	$2,251.00
Equipment Shed	2617	Equipment Shed (10' x 10') made of steel applied over the sampling flume to allow collection of water samples during the winter in colder climates.	Each	$439.29	1	$439.29

Practice: 202 - Edge-of-Field Water Quality Monitoring-System Installation

Scenario: #109 - System Installation-Tile

Scenario Description:

This edge-of-field water quality monitoring system is applicable to a single control or treatment site that has a field defined with tile or other subsurface drainage runoff that can be captured and sampled at the edge of a field before entering a ditch or receiving water body or water course. The component monitoring equipment are associated with a typical system for southern latitudes where winter time heating is not required for sampling. It will allow for installation of automated sampling data collection system for a subsurface collection and separate surface automated sample collection system with protective housing to reduce potential for vandalism, battery backup for operation during periods when electricity is down or solar panels are not creating an electrical current, an area velocity sensor for pipe flow and estimation of submerged flow, and a berm or other directional flow structure to guide the runoff to a sampling flume.

Before Situation:

The agricultural operation prior to installing the monitoring equipment is guessing about the effects of the conservation system with regards to meeting practice intent of avoid, controlling, or trapping sediment and nutrients. Nothing is known about the volume or mass of sediment and nutrients leaving the edge of field through the tile or other subsurface drainage system.

After Situation:

The agricultural operation after installing the monitoring equipment will be receiving feedback in the form of edge-of-field runoff water quality samples. The samples will allow the operator to understand the relationship between rain/irrigation, practice choice, and nutrient inputs effecting nutrient and sediment loss for the field. Thus, providing an opportunity to make adaptive management changes to the agricultural operation to reduce sediment and nutrient loss and/or profitability.

Feature Measure: System installed

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $31,108.53

Scenario Cost/Unit: $31,108.53

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	100	$3,412.00
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	6	$667.26
Materials						
Solar Panels, fixed cost portion	1031	Fixed cost portion of the Solar Panels. This portion is a base cost for all Solar Panels and is not dependant on KiloWatt. The total cost of any Solar Panels will include this fixed cost plus a variable cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drops and etc). This cost will include material, labor and equipment.	Each	$273.31	1	$273.31
Solar Panels, variable cost portion	1135	Variable cost portion of the Solar Panels. This portion IS dependent on the total Kilowatt for the Solar Panels. The total cost of any Solar Panels will include this variable cost plus the fixed cost portion. The completed Solar Panels will include all materials (electrical, controllers, and service drop, etc). This cost will include material, labor and equipment.	Kilowatt	$2,429.59	0.12	$291.55
Heater, high efficiency	1165	Natural gas, propane, or fuel oil unit heater or boiler and venting materials. Based on input kBTU/hour. Includes materials and shipping only.	1,000 BTU/Hour	$16.42	1	$16.42
Weather Station, Advanced	2550	Advance Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, temperature, and solar radiation from a solar powered self-standing tripod to an advance weather recording console. Used for both 449 advance irrigation water management and for Activity 202 water quality monitoring .	Each	$811.13	1	$811.13
Automated sampler with bottles and tubing	2606	Equipment used to collect the water samples on a flow weighted interval of 1.27 mm of runoff (volumetric depth) during a storm event.	Each	$2,139.41	2	$4,278.82
Connectors, cables, platform materials	2607	Miscellaneous (connectors, cables, berm, platform materials); Includes materials only.	Each	$9,207.20	1	$9,207.20
Depth (stage) sensor	2608	Device used to relay information to the Data logger about incremental increases in runoff. ISCO 730 Module with 1/8-in x 25-ft vinyl bubble line. Includes equipment only. Used for A202 water quality monitering	Each	$2,706.00	2	$5,412.00
Equipment shelter	2609	Building designed to house and reduce the risk of equipment damage from weather, animals, and vandalism.	Each	$1,036.93	2	$2,073.86

Pre-calibrated flow control structure-surface	2610	Pre-calibrated flow control structure-surface. Used for A202 water quality monitering	Each	$1,220.00	1	$1,220.00
Pre-calibrated flow control structure-subsurface (pipe flow)	2615	Equipment used to collect runoff for ease in measure of flow, sample collection and to reduce time in constructing and calibrating of a flow structure.	Each	$754.69	1	$754.69
Device, communications	2616	Piece of equipment or hardware designed to transmit real time data or information collected prior to site visits. Includes equipment only.	Each	$2,251.00	1	$2,251.00
Equipment Shed	2617	Equipment Shed (10' x 10') made of steel applied over the sampling flume to allow collection of water samples during the winter in colder climates.	Each	$439.29	1	$439.29

Practice: 202 - Edge-of-Field Water Quality Monitoring-System Installation

Scenario: #116 - System Installation-Surface Cold Climate

Scenario Description:

This edge-of-field water quality monitoring system is applicable to a single control or treatment site that has a field defined with surface runoff that can be captured and sampled at the edge of a field before entering a ditch or receiving water body or water course. The component monitoring equipment are associated with a typical system for northern latitudes where winter time heating is required for sampling. It will allow for installation of automated sampling data collection system with protective housing to reduce potential for vandalism, battery backup for operation during periods when electricity is down or solar panels are not creating an electrical current, a calf hut or other structure with heat is required over the flume to allow sampling under northern latitude winter conditions, and a berm or other directional flow structure to guide the runoff to a sampling flume.

Before Situation:

The agricultural operation prior to installing the monitoring equipment is guessing about the effects of the conservation system with regards to meeting practice intent of avoid, controlling, or trapping sediment and nutrients. Nothing is known about the volume or mass of sediment and nutrients leaving the edge of field through the tile or other subsurface drainage system.

After Situation:

The agricultural operation after installing the monitoring equipment will be receiving feedback in the form of edge-of-field runoff water quality samples. The samples will allow the operator to understand the relationship between rain/irrigation, practice choice, and nutrient inputs effecting nutrient and sediment loss for the field. Thus, providing an opportunity to make adaptive management changes to the agricultural operation to reduce sediment and nutrient loss and/or profitability.

Feature Measure: System installed

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $22,995.49

Scenario Cost/Unit: $22,995.49

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	60	$2,047.20
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	5	$556.05
Materials						
Solar Panels, fixed cost portion	1031	Fixed cost portion of the Solar Panels. This portion is a base cost for all Solar Panels and is not dependant on KiloWatt. The total cost of any Solar Panels will include this fixed cost plus a variable cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drops and etc). This cost will include material, labor and equipment.	Each	$273.31	1	$273.31
Solar Panels, variable cost portion	1135	Variable cost portion of the Solar Panels. This portion IS dependent on the total Kilowatt for the Solar Panels. The total cost of any Solar Panels will include this variable cost plus the fixed cost portion. The completed Solar Panels will include all materials (electrical, controllers, and service drop, etc). This cost will include material, labor and equipment.	Kilowatt	$2,429.59	0.12	$291.55
Heater, high efficiency	1165	Natural gas, propane, or fuel oil unit heater or boiler and venting materials. Based on input kBTU/hour. Includes materials and shipping only.	1,000 BTU/Hour	$16.42	1	$16.42
Weather Station, Advanced	2550	Advance Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, temperature, and solar radiation from a solar powered self-standing tripod to an advance weather recording console. Used for both 449 advance irrigation water management and for Activity 202 water quality monitoring .	Each	$811.13	1	$811.13
Automated sampler with bottles and tubing	2606	Equipment used to collect the water samples on a flow weighted interval of 1.27 mm of runoff (volumetric depth) during a storm event.	Each	$2,139.41	1	$2,139.41
Connectors, cables, platform materials	2607	Miscellaneous (connectors, cables, berm, platform materials); Includes materials only.	Each	$9,207.20	1	$9,207.20
Depth (stage) sensor	2608	Device used to relay information to the Data logger about incremental increases in runoff. ISCO 730 Module with 1/8-in x 25-ft vinyl bubble line. Includes equipment only. Used for A202 water quality monitering	Each	$2,706.00	1	$2,706.00
Equipment shelter	2609	Building designed to house and reduce the risk of equipment damage from weather, animals, and vandalism.	Each	$1,036.93	1	$1,036.93

Pre-calibrated flow control structure-surface	2610	Pre-calibrated flow control structure-surface. Used for A202 water quality monitering	Each	$1,220.00	1	$1,220.00
Device, communications	2616	Piece of equipment or hardware designed to transmit real time data or information collected prior to site visits. Includes equipment only.	Each	$2,251.00	1	$2,251.00
Equipment Shed	2617	Equipment Shed (10' x 10') made of steel applied over the sampling flume to allow collection of water samples during the winter in colder climates.	Each	$439.29	1	$439.29

Practice: 202 - Edge-of-Field Water Quality Monitoring-System Installation

Scenario: #123 - System Installation-Surface

Scenario Description:

This edge-of-field water quality monitoring system is applicable to a single control or treatment site that has a field defined with surface runoff that can be captured and sampled at the edge of a field before entering a ditch or receiving water body or water course. The component monitoring equipment are associated with a typical system for southern latitudes where winter time heating is not required for sampling. It will allow for installation of automated sampling data collection system with protective housing to reduce potential for vandalism, battery backup for operation during periods when electricity is down or solar panels are not creating an electrical current, and a berm or other directional flow structure to guide the runoff to a sampling flume.

Before Situation:

The agricultural operation prior to installing the monitoring equipment is guessing about the effects of the conservation system with regards to meeting practice intent of avoid, controlling, or trapping sediment and nutrients.

After Situation:

The agricultural operation after installing the monitoring equipment will be receiving feedback in the form of edge-of-field runoff water quality samples. The samples will allow the operator to understand the relationship between rain/irrigation, practice choice, and nutrient inputs effecting nutrient and sediment loss for the field. Thus, providing an opportunity to make adaptive management changes to the agricultural operation to reduce sediment and nutrient loss and/or profitability.

Feature Measure: System installed

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $22,539.78

Scenario Cost/Unit: $22,539.78

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	60	$2,047.20
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	5	$556.05
Materials						
Solar Panels, fixed cost portion	1031	Fixed cost portion of the Solar Panels. This portion is a base cost for all Solar Panels and is not dependant on KiloWatt. The total cost of any Solar Panels will include this fixed cost plus a variable cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drops and etc). This cost will include material, labor and equipment.	Each	$273.31	1	$273.31
Solar Panels, variable cost portion	1135	Variable cost portion of the Solar Panels. This portion IS dependent on the total Kilowatt for the Solar Panels. The total cost of any Solar Panels will include this variable cost plus the fixed cost portion. The completed Solar Panels will include all materials (electrical, controllers, and service drop, etc). This cost will include material, labor and equipment.	Kilowatt	$2,429.59	0.12	$291.55
Weather Station, Advanced	2550	Advance Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, temperature, and solar radiation from a solar powered self-standing tripod to an advance weather recording console. Used for both 449 advance irrigation water management and for Activity 202 water quality monitoring .	Each	$811.13	1	$811.13
Automated sampler with bottles and tubing	2606	Equipment used to collect the water samples on a flow weighted interval of 1.27 mm of runoff (volumetric depth) during a storm event.	Each	$2,139.41	1	$2,139.41
Connectors, cables, platform materials	2607	Miscellaneous (connectors, cables, berm, platform materials); Includes materials only.	Each	$9,207.20	1	$9,207.20
Depth (stage) sensor	2608	Device used to relay information to the Data logger about incremental increases in runoff. ISCO 730 Module with 1/8-in x 25-ft vinyl bubble line. Includes equipment only. Used for A202 water quality monitering	Each	$2,706.00	1	$2,706.00
Equipment shelter	2609	Building designed to house and reduce the risk of equipment damage from weather, animals, and vandalism.	Each	$1,036.93	1	$1,036.93
Pre-calibrated flow control structure-surface	2610	Pre-calibrated flow control structure-surface. Used for A202 water quality monitering	Each	$1,220.00	1	$1,220.00
Device, communications	2616	Piece of equipment or hardware designed to transmit real time data or information collected prior to site visits. Includes equipment only.	Each	$2,251.00	1	$2,251.00

Practice: 202 - Edge-of-Field Water Quality Monitoring-System Installation

Scenario: #131 - System Installation-Retrofit Above and Below 1

Scenario Description:

This edge-of-field water quality monitoring system is to retrofit an existing above and below monitoring designed system that is being used in associated with the 799 interim practice or comparable system. The retrofit is applicable to an above and below system that has a field defined with surface or subsurface drainage runoff that can be captured and sampled at the edge of a field before entering a ditch or receiving water body or water course. The data represents the installation of an automated and manual backup rain gauge and two back-up/solar power supply be added to existing paired system.

Before Situation:

The agricultural operation prior to retrofit has an edge-of-field data collection system but it does not meet the present standards for accuracy or reliability as detailed in either or both of Activity 201 and Activity 202.

After Situation:

The agricultural operation after installing the monitoring equipment will be receiving feedback in the form of edge-of-field runoff water quality samples. The samples will allow the operator to understand the relationship between rain/irrigation, practice choice, and nutrient inputs effecting nutrient and sediment loss for the field. Thus, providing an opportunity to make adaptive management changes to the agricultural operation to reduce sediment and nutrient loss and/or profitability.

Feature Measure: System installed

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $3,315.43

Scenario Cost/Unit: $3,315.43

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	32	$1,091.84
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	5	$556.05
Materials						
Solar Panels, fixed cost portion	1031	Fixed cost portion of the Solar Panels. This portion is a base cost for all Solar Panels and is not dependant on KiloWatt. The total cost of any Solar Panels will include this fixed cost plus a variable cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drops and etc). This cost will include material, labor and equipment.	Each	$273.31	1	$273.31
Solar Panels, variable cost portion	1135	Variable cost portion of the Solar Panels. This portion IS dependent on the total Kilowatt for the Solar Panels. The total cost of any Solar Panels will include this variable cost plus the fixed cost portion. The completed Solar Panels will include all materials (electrical, controllers, and service drop, etc). This cost will include material, labor and equipment.	Kilowatt	$2,429.59	0.24	$583.10
Weather Station, Advanced	2550	Advance Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, temperature, and solar radiation from a solar powered self-standing tripod to an advance weather recording console. Used for both 449 advance irrigation water management and for Activity 202 water quality monitoring .	Each	$811.13	1	$811.13

Practice: 202 - Edge-of-Field Water Quality Monitoring-System Installation

Scenario: #140 - System Installation-Retrofit Above 3

Scenario Description:

This edge-of-field water quality monitoring system is to retrofit an existing above and below monitoring designed system that is being used in associated with the 799 interim practice or comparable system. The retrofit is applicable to an above and below system that has a field defined with surface or subsurface drainage runoff that can be captured and sampled at the edge of a field before entering a ditch or receiving water body or water course. The data represents the installation of an automated and manual backup rain gauge, two back-up/solar power supplies, two communications devices, two pre-calibrated flumes, and two depth (stage) sensors to be added to existing paired system.

Before Situation:

The agricultural operation prior to retrofit has an edge-of-field data collection system but it does not meet the present standards for accuracy or reliability as detailed in either or both of Activity 201 and Activity 202.

After Situation:

The agricultural operation after installing the monitoring equipment will be receiving feedback in the form of edge-of-field runoff water quality samples. The samples will allow the operator to understand the relationship between rain/irrigation, practice choice, and nutrient inputs effecting nutrient and sediment loss for the field. Thus, providing an opportunity to make adaptive management changes to the agricultural operation to reduce sediment and nutrient loss and/or profitability.

Feature Measure: System installed

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $16,053.60

Scenario Cost/Unit: $16,053.60

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	40	$1,364.80
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	6	$667.26
Materials						
Solar Panels, fixed cost portion	1031	Fixed cost portion of the Solar Panels. This portion is a base cost for all Solar Panels and is not dependant on KiloWatt. The total cost of any Solar Panels will include this fixed cost plus a variable cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drops and etc). This cost will include material, labor and equipment.	Each	$273.31	1	$273.31
Solar Panels, variable cost portion	1135	Variable cost portion of the Solar Panels. This portion IS dependent on the total Kilowatt for the Solar Panels. The total cost of any Solar Panels will include this variable cost plus the fixed cost portion. The completed Solar Panels will include all materials (electrical, controllers, and service drop, etc). This cost will include material, labor and equipment.	Kilowatt	$2,429.59	0.24	$583.10
Weather Station, Advanced	2550	Advance Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, temperature, and solar radiation from a solar powered self-standing tripod to an advance weather recording console. Used for both 449 advance irrigation water management and for Activity 202 water quality monitoring .	Each	$811.13	1	$811.13
Depth (stage) sensor	2608	Device used to relay information to the Data logger about incremental increases in runoff. ISCO 730 Module with 1/8-in x 25-ft vinyl bubble line. Includes equipment only. Used for A202 water quality monitering	Each	$2,706.00	2	$5,412.00
Pre-calibrated flow control structure-surface	2610	Pre-calibrated flow control structure-surface. Used for A202 water quality monitering	Each	$1,220.00	2	$2,440.00
Device, communications	2616	Piece of equipment or hardware designed to transmit real time data or information collected prior to site visits. Includes equipment only.	Each	$2,251.00	2	$4,502.00

Practice: 202 - Edge-of-Field Water Quality Monitoring-System Installation

Scenario: #148 - System Installation-Retrofit 3

Scenario Description:

This edge-of-field water quality monitoring system is to retrofit an existing system that is being used in associated with the 799 interim practice or comparable system. The retrofit is applicable to a single control or treatment site that has a field defined with surface or subsurface drainage runoff that can be captured and sampled at the edge of a field before entering a ditch or receiving water body or water course. The data represents the installation of an automated and manual backup rain gauge, back-up/solar power supply, communications device, pre-calibrated flow control structure, and depth (stage) sensor to be added to existing system.

Before Situation:

The agricultural operation prior to retrofit has an edge-of-field data collection system but it does not meet the present standards for accuracy or reliability as detailed in either or both of Activity 201 and Activity 202.

After Situation:

The agricultural operation after installing the monitoring equipment will be receiving feedback in the form of edge-of-field runoff water quality samples. The samples will allow the operator to understand the relationship between rain/irrigation, practice choice, and nutrient inputs effecting nutrient and sediment loss for the field. Thus, providing an opportunity to make adaptive management changes to the agricultural operation to reduce sediment and nutrient loss and/or profitability.

Feature Measure: System installed

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $9,200.88

Scenario Cost/Unit: $9,200.88

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	32	$1,091.84
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	5	$556.05
Materials						
Solar Panels, fixed cost portion	1031	Fixed cost portion of the Solar Panels. This portion is a base cost for all Solar Panels and is not dependant on KiloWatt. The total cost of any Solar Panels will include this fixed cost plus a variable cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drops and etc). This cost will include material, labor and equipment.	Each	$273.31	1	$273.31
Solar Panels, variable cost portion	1135	Variable cost portion of the Solar Panels. This portion IS dependent on the total Kilowatt for the Solar Panels. The total cost of any Solar Panels will include this variable cost plus the fixed cost portion. The completed Solar Panels will include all materials (electrical, controllers, and service drop, etc). This cost will include material, labor and equipment.	Kilowatt	$2,429.59	0.12	$291.55
Weather Station, Advanced	2550	Advance Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, temperature, and solar radiation from a solar powered self-standing tripod to an advance weather recording console. Used for both 449 advance irrigation water management and for Activity 202 water quality monitoring .	Each	$811.13	1	$811.13
Depth (stage) sensor	2608	Device used to relay information to the Data logger about incremental increases in runoff. ISCO 730 Module with 1/8-in x 25-ft vinyl bubble line. Includes equipment only. Used for A202 water quality monitering	Each	$2,706.00	1	$2,706.00
Pre-calibrated flow control structure-surface	2610	Pre-calibrated flow control structure-surface. Used for A202 water quality monitering	Each	$1,220.00	1	$1,220.00
Device, communications	2616	Piece of equipment or hardware designed to transmit real time data or information collected prior to site visits. Includes equipment only.	Each	$2,251.00	1	$2,251.00

Practice: 202 - Edge-of-Field Water Quality Monitoring-System Installation

Scenario: #156 - System Installation-Retrofit 2

Scenario Description:

This edge-of-field water quality monitoring system is to retrofit an existing system that is being used in associated with the 799 interim practice or comparable system. The retrofit is applicable to a single control or treatment site that has a field defined with surface or subsurface drainage runoff that can be captured and sampled at the edge of a field before entering a ditch or receiving water body or water course. The data represents the installation of an automated and manual backup rain gauge, back-up/solar power supply, communications device, and depth (stage) sensor to be added to existing system.

Before Situation:

The agricultural operation prior to retrofit has an edge-of-field data collection system but it does not meet the present standards for accuracy or reliability as detailed in either or both of Activity 201 and Activity 202.

After Situation:

The agricultural operation after installing the monitoring equipment will be receiving feedback in the form of edge-of-field runoff water quality samples. The samples will allow the operator to understand the relationship between rain/irrigation, practice choice, and nutrient inputs effecting nutrient and sediment loss for the field. Thus, providing an opportunity to make adaptive management changes to the agricultural operation to reduce sediment and nutrient loss and/or profitability.

Feature Measure: System installed

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $7,571.44

Scenario Cost/Unit: $7,571.44

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	20	$682.40
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	5	$556.05
Materials						
Solar Panels, fixed cost portion	1031	Fixed cost portion of the Solar Panels. This portion is a base cost for all Solar Panels and is not dependant on KiloWatt. The total cost of any Solar Panels will include this fixed cost plus a variable cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drops and etc). This cost will include material, labor and equipment.	Each	$273.31	1	$273.31
Solar Panels, variable cost portion	1135	Variable cost portion of the Solar Panels. This portion IS dependent on the total Kilowatt for the Solar Panels. The total cost of any Solar Panels will include this variable cost plus the fixed cost portion. The completed Solar Panels will include all materials (electrical, controllers, and service drop, etc). This cost will include material, labor and equipment.	Kilowatt	$2,429.59	0.12	$291.55
Weather Station, Advanced	2550	Advance Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, temperature, and solar radiation from a solar powered self-standing tripod to an advance weather recording console. Used for both 449 advance irrigation water management and for Activity 202 water quality monitoring .	Each	$811.13	1	$811.13
Depth (stage) sensor	2608	Device used to relay information to the Data logger about incremental increases in runoff. ISCO 730 Module with 1/8-in x 25-ft vinyl bubble line. Includes equipment only. Used for A202 water quality monitering	Each	$2,706.00	1	$2,706.00
Device, communications	2616	Piece of equipment or hardware designed to transmit real time data or information collected prior to site visits. Includes equipment only.	Each	$2,251.00	1	$2,251.00

Practice: 202 - Edge-of-Field Water Quality Monitoring-System Installation

Scenario: #164 - System Installation-Retrofit 1

Scenario Description:

This edge-of-field water quality monitoring system is to retrofit an existing system that is being used in associated with the 799 interim practice or comparable system. The retrofit is applicable to a single control or treatment site that has a field defined with surface or subsurface drainage runoff that can be captured and sampled at the edge of a field before entering a ditch or receiving water body or water course. The data represents the installation of an automated and manual backup rain gauge and back-up/solar power supply be added to existing system.

Before Situation:

The agricultural operation prior to retrofit has an edge-of-field data collection system but it does not meet the present standards for accuracy or reliability as detailed in either or both of Activity 201 and Activity 202.

After Situation:

The agricultural operation after installing the monitoring equipment will be receiving feedback in the form of edge-of-field runoff water quality samples. The samples will allow the operator to understand the relationship between rain/irrigation, practice choice, and nutrient inputs effecting nutrient and sediment loss for the field. Thus, providing an opportunity to make adaptive management changes to the agricultural operation to reduce sediment and nutrient loss and/or profitability.

Feature Measure: System installed

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $2,477.96

Scenario Cost/Unit: $2,477.96

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	16	$545.92
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	5	$556.05
Materials						
Solar Panels, fixed cost portion	1031	Fixed cost portion of the Solar Panels. This portion is a base cost for all Solar Panels and is not dependant on KiloWatt. The total cost of any Solar Panels will include this fixed cost plus a variable cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drops and etc). This cost will include material, labor and equipment.	Each	$273.31	1	$273.31
Solar Panels, variable cost portion	1135	Variable cost portion of the Solar Panels. This portion IS dependent on the total Kilowatt for the Solar Panels. The total cost of any Solar Panels will include this variable cost plus the fixed cost portion. The completed Solar Panels will include all materials (electrical, controllers, and service drop, etc). This cost will include material, labor and equipment.	Kilowatt	$2,429.59	0.12	$291.55
Weather Station, Advanced	2550	Advance Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, temperature, and solar radiation from a solar powered self-standing tripod to an advance weather recording console. Used for both 449 advance irrigation water management and for Activity 202 water quality monitoring .	Each	$811.13	1	$811.13

Practice: 202 - Edge-of-Field Water Quality Monitoring-System Installation

Scenario: #172 - System Installation-Above And Below cold climate

Scenario Description:

This edge-of-field water quality monitoring system is applicable where a conservation practice has a pre- and post treatment area in the same field drainage with surface or subsurface drainage runoff that can be captured and sampled at the edge of a field before entering a ditch or receiving water body or water course. The component monitoring equipment are associated with a typical system for northern latitudes where winter time heating is required for sampling. It will allow for installation of automated sampling data collection system with protective housing to reduce potential for vandalism, battery backup for operation during periods when electricity is down or solar panels are not creating an electrical current, a calf hut or other structure with heat is required over the flume to allow sampling under northern latitude winter conditions, and a berm or other directional flow structure to guide the runoff to a sampling flume. The actual installation will different on the subsurface flow by allowing a smaller pre-calibrated flume with the addition of a velocity sensor meter as in the tile alternative.

Before Situation:

The agricultural operation prior to installing the monitoring equipment is guessing about the effects of the conservation system with regards to meeting practice intent of avoid, controlling, or trapping sediment and nutrients. Nothing is known about the volume or mass of sediment and nutrients leaving the edge of field through the tile or other subsurface drainage system.

After Situation:

The agricultural operation after installing the monitoring equipment will be receiving feedback in the form of edge-of-field runoff water quality samples. The samples will allow the operator to understand the relationship between rain/irrigation, practice choice, and nutrient inputs effecting nutrient and sediment loss for the field. Thus, providing an opportunity to make adaptive management changes to the agricultural operation to reduce sediment and nutrient loss and/or profitability.

Feature Measure: System installed

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $32,915.75

Scenario Cost/Unit: $32,915.75

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	60	$2,047.20
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	6	$667.26
Materials						
Solar Panels, fixed cost portion	1031	Fixed cost portion of the Solar Panels. This portion is a base cost for all Solar Panels and is not dependant on KiloWatt. The total cost of any Solar Panels will include this fixed cost plus a variable cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drops and etc). This cost will include material, labor and equipment.	Each	$273.31	1	$273.31
Solar Panels, variable cost portion	1135	Variable cost portion of the Solar Panels. This portion IS dependent on the total Kilowatt for the Solar Panels. The total cost of any Solar Panels will include this variable cost plus the fixed cost portion. The completed Solar Panels will include all materials (electrical, controllers, and service drop, etc). This cost will include material, labor and equipment.	Kilowatt	$2,429.59	0.12	$291.55
Heater, high efficiency	1165	Natural gas, propane, or fuel oil unit heater or boiler and venting materials. Based on input kBTU/hour. Includes materials and shipping only.	1,000 BTU/Hour	$16.42	2	$32.84
Weather Station, Advanced	2550	Advance Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, temperature, and solar radiation from a solar powered self-standing tripod to an advance weather recording console. Used for both 449 advance irrigation water management and for Activity 202 water quality monitoring .	Each	$811.13	1	$811.13
Automated sampler with bottles and tubing	2606	Equipment used to collect the water samples on a flow weighted interval of 1.27 mm of runoff (volumetric depth) during a storm event.	Each	$2,139.41	2	$4,278.82
Connectors, cables, platform materials	2607	Miscellaneous (connectors, cables, berm, platform materials); Includes materials only.	Each	$9,207.20	1	$9,207.20
Depth (stage) sensor	2608	Device used to relay information to the Data logger about incremental increases in runoff. ISCO 730 Module with 1/8-in x 25-ft vinyl bubble line. Includes equipment only. Used for A202 water quality monitering	Each	$2,706.00	2	$5,412.00
Equipment shelter	2609	Building designed to house and reduce the risk of equipment damage from weather, animals, and vandalism.	Each	$1,036.93	2	$2,073.86

Pre-calibrated flow control structure-surface	2610	Pre-calibrated flow control structure-surface. Used for A202 water quality monitering	Each	$1,220.00	2	$2,440.00
Device, communications	2616	Piece of equipment or hardware designed to transmit real time data or information collected prior to site visits. Includes equipment only.	Each	$2,251.00	2	$4,502.00
Equipment Shed	2617	Equipment Shed (10' x 10') made of steel applied over the sampling flume to allow collection of water samples during the winter in colder climates.	Each	$439.29	2	$878.58

Practice: 202 - Edge-of-Field Water Quality Monitoring-System Installation

Scenario: #180 - System Installation-Above And Below

Scenario Description:

This edge-of-field water quality monitoring system is applicable where a conservation practice has a pre- and post treatment area in the same field drainage with surface or subsurface drainage runoff that can be captured and sampled at the edge of a field before entering a ditch or receiving water body or water course. The component monitoring equipment are associated with a typical system for southern latitudes where winter time heating is not required for sampling. It will allow for installation of automated sampling data collection system with protective housing to reduce potential for vandalism, battery backup for operation during periods when electricity is down or solar panels are not creating an electrical current, and a berm or other directional flow structure to guide the runoff to a sampling flume. The actual installation will different on the subsurface flow by allowing a smaller precalibrated flume with the addition of a velocity sensor meter as in the tile alternative.

Before Situation:

The agricultural operation prior to installing the monitoring equipment is guessing about the effects of the conservation system with regards to meeting practice intent of avoid, controlling, or trapping sediment and nutrients.

After Situation:

The agricultural operation after installing the monitoring equipment will be receiving feedback in the form of edge-of-field runoff water quality samples. The samples will allow the operator to understand the relationship between rain/irrigation, practice choice, and nutrient inputs effecting nutrient and sediment loss for the field. Thus, providing an opportunity to make adaptive management changes to the agricultural operation to reduce sediment and nutrient loss and/or profitability.

Feature Measure: System installed

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $29,753.33

Scenario Cost/Unit: $29,753.33

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	60	$2,047.20
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	6	$667.26
Materials						
Solar Panels, fixed cost portion	1031	Fixed cost portion of the Solar Panels. This portion is a base cost for all Solar Panels and is not dependant on KiloWatt. The total cost of any Solar Panels will include this fixed cost plus a variable cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drops and etc). This cost will include material, labor and equipment.	Each	$273.31	1	$273.31
Solar Panels, variable cost portion	1135	Variable cost portion of the Solar Panels. This portion IS dependent on the total Kilowatt for the Solar Panels. The total cost of any Solar Panels will include this variable cost plus the fixed cost portion. The completed Solar Panels will include all materials (electrical, controllers, and service drop, etc). This cost will include material, labor and equipment.	Kilowatt	$2,429.59	0.12	$291.55
Weather Station, Advanced	2550	Advance Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, temperature, and solar radiation from a solar powered self-standing tripod to an advance weather recording console. Used for both 449 advance irrigation water management and for Activity 202 water quality monitoring .	Each	$811.13	1	$811.13
Automated sampler with bottles and tubing	2606	Equipment used to collect the water samples on a flow weighted interval of 1.27 mm of runoff (volumetric depth) during a storm event.	Each	$2,139.41	2	$4,278.82
Connectors, cables, platform materials	2607	Miscellaneous (connectors, cables, berm, platform materials); Includes materials only.	Each	$9,207.20	1	$9,207.20
Depth (stage) sensor	2608	Device used to relay information to the Data logger about incremental increases in runoff. ISCO 730 Module with 1/8-in x 25-ft vinyl bubble line. Includes equipment only. Used for A202 water quality monitering	Each	$2,706.00	2	$5,412.00
Equipment shelter	2609	Building designed to house and reduce the risk of equipment damage from weather, animals, and vandalism.	Each	$1,036.93	2	$2,073.86
Pre-calibrated flow control structure-surface	2610	Pre-calibrated flow control structure-surface. Used for A202 water quality monitering	Each	$1,220.00	2	$2,440.00
Device, communications	2616	Piece of equipment or hardware designed to transmit real time data or information collected prior to site visits. Includes equipment only.	Each	$2,251.00	1	$2,251.00

Practice: 216 - Soil Testing

Scenario: #12 - Basic Soil Health Suite: TSP

Scenario Description:

A laboratory soil health assessment is conducted using recommended methods in technical note 450-03 to design the implementation requirements (IR) for a practice. Laboratory tests must be conducted according to technical note 450-03 and consist of all the following approved "basic package" indicators: soil organic carbon, aggregation, bioavailable nitrogen, respiration, and active carbon. This scenario assumes that a comprehensive chemical soil test (macronutrients + micronutrients) has been completed on the same management unit in the last 2 years. Sample collection and IR development is completed by a TSP and includes time for soil sampling and IR development. This scenario may be used after a CAP 116 has been completed or as a companion with CAP 116.

Before Situation:

Agricultural producer has been farming a system that has not addressed all 4 of the soil health principles. Producer has noticed yield declines, soil degradation, or is simply interested in learning more about soil health management. A CAP 116 has been completed or is being planned to identify core soil health practices needed to address the resource concerns.

After Situation:

A laboratory soil health test was completed and the results were interpreted (scored) and explained to the producer. Job sheets or implementation requirements for soil health practices were developed by a TSP.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 5.0

Scenario Total Cost: $1,220.90

Scenario Cost/Unit: $244.18

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	2.5	$85.30
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	5	$556.05
Materials						
Test, Soil Health, Basic Package	2734	Basic soil health laboratory assessment for soil organic carbon, aggregation, bioavailable nitrogen, respiration, and active carbon according to technical note 450-03. Includes shipping and handling.	Number	$115.91	5	$579.55

Practice: 216 - Soil Testing

Scenario: #69 - Basic Soil Health Suite + Comprehensive Chemical: TSP

Scenario Description:

A laboratory soil health assessment is conducted using recommended methods in technical note 450-03 to design the implementation requirements (IR) for a practice. Laboratory tests must be conducted according to technical note 450-03 and consist of all the following approved "basic package" indicators: soil organic carbon, aggregation, bioavailable nitrogen, respiration, and active carbon. A comprehensive chemical soil test (pH, electroconductivity, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, and zinc) is required along with the soil health test. Sample collection and IR development is completed by a TSP and includes time for soil sampling and IR development. This scenario may be used after a CAP 116 has been completed or as a companion with CAP 116.

Before Situation:

Agricultural producer has been farming a system that has not addressed all 4 of the soil health principles. Producer has noticed yield declines, soil degradation, or is simply interested in learning more about soil health management. A CAP 116 has been completed or is being planned to identify core soil health practices needed to address the resource concerns.

After Situation:

A laboratory soil health test was completed and the results were interpreted (scored) and explained to the producer. Job sheets or implementation requirements for soil health practices were developed by a TSP.

Feature Measure: Each

Scenario Unit: Number

Scenario Typical Size: 5.0

Scenario Total Cost: $1,693.72

Scenario Cost/Unit: $338.74

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	2.5	$85.30
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	7	$778.47
Materials						
Test, Soil Test, Comprehensive	2384	Comprehensive Soil Testing for pH, EC, nitrates, ammonium, phosphorus, potassium, organic matter and other micro-nutrients. Includes materials and shipping only.	Each	$50.08	5	$250.40
Test, Soil Health, Basic Package	2734	Basic soil health laboratory assessment for soil organic carbon, aggregation, bioavailable nitrogen, respiration, and active carbon according to technical note 450-03. Includes shipping and handling.	Number	$115.91	5	$579.55

Practice: 216 - Soil Testing

Scenario: #70 - Basic Soil Health Suite + Comprehensive Chemical: Cons Plan

Scenario Description:

A laboratory soil health assessment is conducted using recommended methods in technical note 450-03 to design the implementation requirements (IR) for a practice. Laboratory tests must be conducted according to technical note 450-03 and consist of all the following approved "basic package" indicators: soil organic carbon, aggregation, bioavailable nitrogen, respiration, and active carbon. A comprehensive chemical soil test (pH, electroconductivity, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, and zinc) is required along with the soil health test. Sample collection and IR development is completed by NRCS staff and this scenario only includes the cost of the test.

Before Situation:

A CAP 116 has been completed or a conservation plan with core soil health practices is scheduled for installation.

After Situation:

A laboratory soil health test was completed and the results were interpreted (scored) and explained to the producer. Job sheets or implementation requirements for soil health practices were developed by NRCS staff using the results from the soil health test.

Feature Measure: Each

Scenario Unit: Number

Scenario Typical Size: 5.0

Scenario Total Cost: $829.95

Scenario Cost/Unit: $165.99

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Materials						
Test, Soil Test, Comprehensive	2384	Comprehensive Soil Testing for pH, EC, nitrates, ammonium, phosphorus, potassium, organic matter and other micro-nutrients. Includes materials and shipping only.	Each	$50.08	5	$250.40
Test, Soil Health, Basic Package	2734	Basic soil health laboratory assessment for soil organic carbon, aggregation, bioavailable nitrogen, respiration, and active carbon according to technical note 450-03. Includes shipping and handling.	Number	$115.91	5	$579.55

Practice: 216 - Soil Testing

Scenario: #71 - Basic Soil Health Suite + Comprehensive Chemical: TSP Sample

Scenario Description:

A laboratory soil health assessment is conducted using recommended methods in technical note 450-03 to design the implementation requirements (IR) for a practice. Laboratory tests must be conducted according to technical note 450-03 and consist of all the following approved "basic package" indicators: soil organic carbon, aggregation, bioavailable nitrogen, respiration, and active carbon. A comprehensive chemical soil test (pH, electroconductivity, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, and zinc) is required along with the soil health test. Sample collection is completed by a TSP and implementation requirements are completed by NRCS staff.

Before Situation:

A CAP 116 has been completed or an a conservation plan with core soil health practices is scheduled for installation.

After Situation:

A laboratory soil health test was completed and the results were interpreted (scored) and explained to the producer. Job sheets or implementation requirements for soil health practices were developed.

Feature Measure: Each

Scenario Unit: Number

Scenario Typical Size: 5.0

Scenario Total Cost: $1,026.46

Scenario Cost/Unit: $205.29

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	2.5	$85.30
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	1	$111.21
Materials						
Test, Soil Test, Comprehensive	2384	Comprehensive Soil Testing for pH, EC, nitrates, ammonium, phosphorus, potassium, organic matter and other micro-nutrients. Includes materials and shipping only.	Each	$50.08	5	$250.40
Test, Soil Health, Basic Package	2734	Basic soil health laboratory assessment for soil organic carbon, aggregation, bioavailable nitrogen, respiration, and active carbon according to technical note 450-03. Includes shipping and handling.	Number	$115.91	5	$579.55

Practice: 216 - Soil Testing

Scenario: #72 - Basic Soil Health Suite: Cons. Plan

Scenario Description:

A laboratory soil health assessment is conducted using recommended methods in technical note 450-03 to design the implementation requirements (IR) for a practice. Laboratory tests must be conducted according to technical note 450-03 and consist of all the following approved "basic package" indicators: soil organic carbon, aggregation, bioavailable nitrogen, respiration, and active carbon. This scenario assumes that a comprehensive chemical soil test (macronutrients + micronutrients) has been completed on the same management unit in the last 2 years. Sample collection and IR development is completed by NRCS staff and this scenario only includes the cost of the test.

Before Situation:

A CAP 116 has been completed or a conservation plan with core soil health practices is scheduled for installation.

After Situation:

A laboratory soil health test was completed and the results were interpreted (scored) and explained to the producer. Job sheets or implementation requirements for soil health practices were developed by NRCS staff using the results from the soil health test.

Feature Measure: Each

Scenario Unit: Number

Scenario Typical Size: 5.0

Scenario Total Cost: $579.55

Scenario Cost/Unit: $115.91

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Materials						
Test, Soil Health, Basic Package	2734	Basic soil health laboratory assessment for soil organic carbon, aggregation, bioavailable nitrogen, respiration, and active carbon according to technical note 450-03. Includes shipping and handling.	Number	$115.91	5	$579.55

Practice: 216 - Soil Testing

Scenario: #73 - Basic Soil Health Suite: TSP Sample

Scenario Description:

A laboratory soil health assessment is conducted using recommended methods in technical note 450-03 to design the implementation requirements (IR) for a practice. Laboratory tests must be conducted according to technical note 450-03 and consist of all the following approved "basic package" indicators: soil organic carbon, aggregation, bioavailable nitrogen, respiration, and active carbon. This scenario assumes that a comprehensive chemical soil test (macronutrients + micronutrients) has been completed on the same management unit in the last 2 years. Sample collection is completed by a TSP and implementation requirements are completed by NRCS staff.

Before Situation:

A CAP 116 has been completed or an a conservation plan with core soil health practices is scheduled for installation.

After Situation:

A laboratory soil health test was completed and the results were interpreted (scored) and explained to the producer. Job sheets or implementation requirements for soil health practices were developed.

Feature Measure: Each

Scenario Unit: Number

Scenario Typical Size: 5.0

Scenario Total Cost: $776.06

Scenario Cost/Unit: $155.21

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	2.5	$85.30
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	1	$111.21
Materials						
Test, Soil Health, Basic Package	2734	Basic soil health laboratory assessment for soil organic carbon, aggregation, bioavailable nitrogen, respiration, and active carbon according to technical note 450-03. Includes shipping and handling.	Number	$115.91	5	$579.55

Practice: 216 - Soil Testing

Scenario: #74 - Single Soil Health Indicator: TSP

Scenario Description:

One soil health indicator is measured in a laboratory using recommended methods in technical note 450-03. This scenario is used to assess a specific indicator to design the implementation requirements (IR) for a practice . Common examples include measuring: soil organic carbon, soil respiration, or aggregate stability. May also be used for other methods recommended in technical note 450-03, such as phospholipid fatty acid (PLFA) or soil enzymes. Sample collection and IR development is completed by a TSP and includes time for soil sampling and IR development. This scenario may be used after a CAP 116 has been completed or as a companion with CAP 116.

Before Situation:

Agricultural producer has been farming a system that has not addressed all 4 of the soil health principles. Producer has noticed yield declines, soil degradation, or is simply interested in learning more about soil health management. A CAP 116 has been completed or is being planned to identify core soil health practices needed to address the resource concerns.

After Situation:

A laboratory soil health test was completed and the results were interpreted (scored) and explained to the producer. Job sheets or implementation requirements for soil health practices were developed by a TSP.

Feature Measure: Each

Scenario Unit: Number

Scenario Typical Size: 5.0

Scenario Total Cost: $423.63

Scenario Cost/Unit: $84.73

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	2.5	$85.30
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	2	$222.42
Materials						
Test, Soil Health, Basic Package	2734	Basic soil health laboratory assessment for soil organic carbon, aggregation, bioavailable nitrogen, respiration, and active carbon according to technical note 450-03. Includes shipping and handling.	Number	$115.91	1	$115.91

Practice: 216 - Soil Testing

Scenario: #75 - Single Soil Health Indicator: TSP Sample

Scenario Description:

One soil health indicator is measured in a laboratory using recommended methods in technical note 450-03. This scenario is used to assess a specific indicator to design the implementation requirements (IR) for a practice . Common examples include measuring: soil organic carbon, soil respiration, or aggregate stability. May also be used for other methods recommended in technical note 450-03, such as phospholipid fatty acid (PLFA) or soil enzymes. Sample collection is completed by a TSP and implementation requirements are completed by NRCS staff.

Before Situation:

A CAP 116 has been completed or an a conservation plan with core soil health practices is scheduled for installation.

After Situation:

A laboratory soil health test was completed and the results were interpreted (scored) and explained to the producer. Job sheets or implementation requirements for soil health practices were developed.

Feature Measure: Each

Scenario Unit: Number

Scenario Typical Size: 5.0

Scenario Total Cost: $256.82

Scenario Cost/Unit: $51.36

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	2.5	$85.30
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	0.5	$55.61
Materials						
Test, Soil Health, Basic Package	2734	Basic soil health laboratory assessment for soil organic carbon, aggregation, bioavailable nitrogen, respiration, and active carbon according to technical note 450-03. Includes shipping and handling.	Number	$115.91	1	$115.91

Practice: 216 - Soil Testing

Scenario: #76 - Single Soil Health Indicator: Cons Plan

Scenario Description:

One soil health indicator is measured in a laboratory using recommended methods in technical note 450-03. This scenario is used to assess a specific indicator to design the implementation requirements (IR) for a practice . Common examples include measuring: soil organic carbon, soil respiration, or aggregate stability. May also be used for other methods recommended in technical note 450-03, such as phospholipid fatty acid (PLFA) or soil enzymes. Sample collection and IR development is completed by NRCS staff and this scenario only includes the cost of the test.

Before Situation:

A CAP 116 has been completed or a conservation plan with core soil health practices is scheduled for installation.

After Situation:

A laboratory soil health test was completed and the results were interpreted (scored) and explained to the producer. Job sheets or implementation requirements for soil health practices were developed by NRCS staff using the results from the soil health test.

Feature Measure: Each

Scenario Unit: Number

Scenario Typical Size: 5.0

Scenario Total Cost: $115.91

Scenario Cost/Unit: $23.18

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Materials						
Test, Soil Health, Basic Package	2734	Basic soil health laboratory assessment for soil organic carbon, aggregation, bioavailable nitrogen, respiration, and active carbon according to technical note 450-03. Includes shipping and handling.	Number	$115.91	1	$115.91

Practice: 309 - Agrichemical Handling Facility

Scenario: #1 - Enclosed building for storage and handling

Scenario Description:

This practice scenario is an agrichemical handling facility for storage and mixing and loading operations. This practice addresses water quality degradation and due to mis-handling, storing and mixing of agrichemicals where nutrients and/or chemicals are running off into surface waters or leaching into ground water. Associated practices: Heavy Use Area Protection (561), Diversion (362), Access Road (560), Pipeline (516), Roof Runoff Management (558), Pumping Plant for Water Control (533), Nutrient Management (590), Pest Management (595)

Before Situation:

Agrichemicals are improperly stored on the ground or next to a well. Operator mixes the agrichemicals and fills the sprayer tank next to a hydrant. Spills or overflows of agrichemicals contaminate the soil, runoff to surface waters and leaching to ground water.

After Situation:

An agrichemical storage and handling facility is constructed inside an enclosed building. The average size of the agrichemical handling facility for storage and mixing and loading is 35' x 40' with an application equipment length of 36 ft. The handling pad for mixing and loading operations is sized to contain the length of the agrichemical spray tank and its volume. Install a curbed reinforced concrete handling pad for mixing and loading with proper storage of associated dry and/or liquid agrichemicals. The concrete is sealed and sloped to a collection sump, facility containment is surrounded by square and ramped curbs. This practice will contain agrichemicals and prevent contamination of surface and ground water resources.

Feature Measure: Total Containment Area

Scenario Unit: Square Feet

Scenario Typical Size: 1,400.0

Scenario Total Cost: $38,262.62

Scenario Cost/Unit: $27.33

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$372.36	18	$6,702.48
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$494.40	10	$4,944.00
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.89	8	$407.12
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	8	$269.12
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic Yards	$28.74	22	$632.28
Post Frame Building, enclosed 4 sides	1046	Enclosed post frame building, four walls. Building sites with expected snow loads up to 30 lbs per square foot and wind exposure in semi protected areas (wooded or terrain with numerous closely spaced obstructions). Includes materials, shipping, and labor only.	Square Feet	$13.02	1760	$22,915.20
Painting, porous surface, impermeable	1497	Painting of concrete, foam or other porous surfaces with an impermeable coating. Includes materials and application.	Square Feet	$1.00	1400	$1,400.00
Emergency shower and eye wash station	1499	Emergency shower and ewe wash station unit. Materials only.	Each	$691.62	1	$691.62
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	1	$65.09
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 309 - Agrichemical Handling Facility

Scenario: #2 - Earthen Liquid Storage With A Concrete Handling Pad

Scenario Description:

An earthen lined agrichemical handling facility is constructed for storage of liquid agrichemicals along with a concrete handling pad for mixing and loading operations. This practice addresses water quality degradation and due to mis-handling, storing, and mixing of agrichemicals where nutrients and/or chemicals are running off into surface waters or leaching into ground water. Associated practices: Heavy Use Area Protection (561), Diversion (362), Access Road (560), Pipeline (516), Pumping Plant for Water Control (533), Nutrient Management (590), Pest Management (595), Pond Sealing or Lining Flexible Membrane (521A)

Before Situation:

Agrichemicals are improperly stored on the ground or next to a well. Operator mixes the agrichemicals and fills the sprayer tank next to a hydrant. Spills or overflows of agrichemicals contaminate the soil, runoff to surface waters and leaching to ground water.

After Situation:

An agrichemical handling facility is constructed for storage of liquid agrichemicals along with a handling pad for mixing and loading operations. The average size of the agrichemical handling facility for proper storage of liquid agrichemicals is in an earthen lined containment with bottom dimensions of 30 ft x 40 ft. A handling pad for mixing and loading is located next to the liquid containment and is 20' x 40' with an application equipment length of 36 ft. The handling pad for mixing and loading operations is sized to contain the length of the agrichemical spray tank and its volume. Install a curbed (6") reinforced concrete handling pad for mixing and loading. The concrete is sealed and sloped to a collection sump. This practice will contain agrichemicals and prevent contamination of surface and ground water resources.

Feature Measure: Floor surface area of Liquid Contain

Scenario Unit: Square Feet

Scenario Typical Size: 2,000.0

Scenario Total Cost: $8,215.95

Scenario Cost/Unit: $4.11

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$372.36	15	$5,585.40
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.37	70	$95.90
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	235	$488.80
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic Yards	$28.74	13	$373.62
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	9	$270.63
Painting, porous surface, impermeable	1497	Painting of concrete, foam or other porous surfaces with an impermeable coating. Includes materials and application.	Square Feet	$1.00	800	$800.00
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	2	$130.18
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 309 - Agrichemical Handling Facility

Scenario: #3 - Fabricated Liquid Storage With Adjacent Concrete Handling Pad

Scenario Description:

This practice scenario is a fabricated agrichemical handling facility for storage of liquid agrichemicals along with an adjacent concrete mixing and loading pad. Due to topography, limited site space and/or geological conditions a fabricated structure is needed. This practice addresses water quality degradation and due to mis-handling, storing, and mixing of agrichemicals where nutrients and/or chemicals are running off into surface waters or leaching into ground water. Associated practices: Heavy Use Area Protection (561), Diversion (362), Access Road (560), Pipeline (516), Pumping Plant for Water Control (533), Nutrient Management (590), Pest Management (595), Pond Sealing or Lining Flexible Membrane (521A)

Before Situation:

Agrichemicals are improperly stored on the ground or next to a well. Operator mixes the agrichemicals and fills the sprayer tank next to a hydrant. Spills or overflows of agrichemicals contaminate the soil, runoff to surface waters and leaching to ground water.

After Situation:

An agrichemical handling facility is constructed for storage of liquid agrichemicals along with an adjacent handling pad for mixing and loading operations. The average size of the fabricated containment is 30 ft x 40 ft with flexible membrane lined walls. The walls are of modular blocks stacked two high for a 4ft wall height on four sides. A handling pad for mixing and loading is located adjacent to the liquid containment and is 16' x 32' with an application equipment length of 28 ft. The handling pad for mixing and loading operations is sized to contain the length of the agrichemical spray tank and its volume. Install a curbed (6") reinforced concrete handling pad for mixing and loading. The concrete is sealed and sloped to a collection sump. This practice will contain agrichemicals and prevent contamination of surface and ground water resources.

Feature Measure: Liquid Containment Area + Handlin

Scenario Unit: Square Feet

Scenario Typical Size: 1,712.0

Scenario Total Cost: $19,433.39

Scenario Cost/Unit: $11.35

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$372.36	19	$7,074.84
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$494.40	8	$3,955.20
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.37	15	$20.55
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.89	8	$407.12
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.72	8	$405.76
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic Yards	$28.74	27	$775.98
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	4	$120.28
Block, pre-cast concrete, modular	1496	Pre-cast concrete blocks, typically 2ft x 2ft x 6ft , includes installation and delivery.	Cubic Yards	$134.22	42	$5,637.24
Painting, porous surface, impermeable	1497	Painting of concrete, foam or other porous surfaces with an impermeable coating. Includes materials and application.	Square Feet	$1.00	512	$512.00
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	2	$130.18
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 309 - Agrichemical Handling Facility

Scenario: #4 - Outdoor Liquid Storage, Roofed Building and Pad

Scenario Description:

This practice scenario is an outdoor, earthen lined agrichemical handling facility for storage of liquid agrichemicals along with a roofed mixing and loading pad that is also sized to store dry chemicals. This practice addresses water quality degradation and due to mis-handling, storing, and mixing of agrichemicals where nutrients and/or chemicals are running off into surface waters or leaching into ground water. Associated practices: Heavy Use Area Protection (561), Diversion (362), Access Road (560), Pipeline (516), Pumping Plant for Water Control (533), Nutrient Management (590), Pest Management (595), Pond Sealing or Lining Flexible Membrane (521A), Roof Runoff Management (558)

Before Situation:

Agrichemicals are improperly stored on the ground or next to a well. Operator mixes the agrichemicals and fills the sprayer tank next to a hydrant. Spills or overflows of agrichemicals contaminate the soil, runoff to surface waters and leaching to ground water.

After Situation:

An agrichemical handling facility is constructed for storage of liquid agrichemicals along with a roofed building to store dry agrichemicals with a handling pad for mixing and loading operations. The average size of the agrichemical handling facility for proper storage of liquid agrichemicals is in an earthen lined containment with bottom dimensions of 60 ft x 40 ft. A roofed building for dry agrichemicals and handling pad for mixing and loading is located next to the liquid containment and is 30' x 40' with an application equipment length of 36 ft. The handling pad for mixing and loading operations is roofed and sized to contain the length of the agrichemical spray tank and its volume. Install a curbed (6") reinforced concrete handling pad for mixing and loading. The concrete is sealed and sloped to a collection sump, facility contaiment has at least two sides construced of 5 ft post and plant walls. This practice will contain agrichemicals and prevent contamination of surface and ground water resources.

Feature Measure: Floor surface area of Liquid Contain

Scenario Unit: Square Feet

Scenario Typical Size: 3,600.0

Scenario Total Cost: $39,922.85

Scenario Cost/Unit: $11.09

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$372.36	19	$7,074.84
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$494.40	3	$1,483.20
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.37	231	$316.47
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	380	$790.40
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	80	$1,935.20
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic Yards	$28.74	19	$546.06
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	38	$1,142.66
Dimension Lumber, Treated	1044	Treated dimension lumber with nominal thickness equal or less than 2". Includes lumber and fasteners	Board Feet	$1.14	853	$972.42
Painting, porous surface, impermeable	1497	Painting of concrete, foam or other porous surfaces with an impermeable coating. Includes materials and application.	Square Feet	$1.00	1200	$1,200.00
Roof, Post Frame Building, 30' to 60' wide	1676	Post Frame Building, no sides, - 30' to 60' width. Building sites with expected snow loads up to 30 lbs per square foot and wind exposure in semi protected areas (wooded or terrain with numerous closely spaced obstructions). Includes materials, shipping, equipment, and installation. Does not include foundation preparation.	Square Feet	$11.93	2000	$23,860.00
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	2	$130.18
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 309 - Agrichemical Handling Facility

Scenario: #5 - Concrete Pad For Mixing and Loading

Scenario Description:

This practice scenario is an agrichemical handling facility for mixing and loading operations. This practice addresses water quality degradation and due to mis-handling, and mixing of agrichemicals where nutrients and/or chemicals are running off into surface waters or leaching into ground water. Associated practices: Heavy Use Area Protection (561), Diversion (362), Access Road (560), Pipeline (516), Pumping Plant for Water Control (533), Nutrient Management (590), Pest Management (595)

Before Situation:

Agrichemicals are improperly stored on the ground or next to a well. Operator mixes the agrichemicals and fills the sprayer tank next to a hydrant. Spills or overflows of agrichemicals contaminate the soil, runoff to surface waters and leaching to ground water.

After Situation:

This scenario is an agrichemical handling facility pad for mixing and loading operations. The average size of the agrichemical handling pad for mixing and loading is 16' x 40' with an application equipment length of 36 ft. The handling pad for mixing and loading operations is sized to contain the length of the agrichemical spray tank and its volume. Install a curbed reinforced concrete handling pad for mixing and loading. The concrete is sealed and sloped to a collection sump, containment of the pad is surrounded by sloped and ramped reinforced concrete. This practice will contain agrichemicals and prevent contamination of surface and ground water resources.

Feature Measure: Total Containment Area

Scenario Unit: Square Feet

Scenario Typical Size: 640.0

Scenario Total Cost: $6,131.40

Scenario Cost/Unit: $9.58

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$372.36	12	$4,468.32
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.89	4	$203.56
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	4	$96.76
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	4	$134.56
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic Yards	$28.74	10	$287.40
Painting, porous surface, impermeable	1497	Painting of concrete, foam or other porous surfaces with an impermeable coating. Includes materials and application.	Square Feet	$1.00	640	$640.00
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	1	$65.09
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 309 - Agrichemical Handling Facility

Scenario: #6 - For Greenhouse, Pallet Drum Storage And Poly Pad For Handling

Scenario Description:

This practice scenario is an agrichemical storage and handling facility for mixing and loading operations within a greenhouse. This practice addresses water quality degradation and due to mis-handling, storing, and mixing of agrichemicals where nutrients and/or chemicals are running off into surface waters or leaching into ground water. Associated practices: Heavy Use Area Protection (561), Diversion (362), Pipeline (516), Pumping Plant for Water Control (533), Nutrient Management (590), Pest Management (595)

Before Situation:

Agrichemicals are improperly stored on the ground or next to a well. Operator mixes the agrichemicals and fills the sprayer tank next to a hydrant. Spills or overflows of agrichemicals contaminate the soil, runoff to surface waters and leaching to ground water.

After Situation:

This scenario is an agrichemical handling facility storage an impermeable barrier poly pad for mixing and loading operations. The average size of the agrichemical handling storage is for a pallet drum on a 5 ft x 5 ft contaiment pallet with sump capacity included. A poly pad is used for mixing and loading that is 8ft x 8ft with an application equipment length of 4 ft. The handling pad for mixing and loading operations is sized to contain the length of the agrichemical spray tank and its volume. This practice will contain agrichemicals and prevent contamination of surface and ground water resources.

Feature Measure: Storage Area + Mixing Area

Scenario Unit: Square Feet

Scenario Typical Size: 89.0

Scenario Total Cost: $1,687.56

Scenario Cost/Unit: $18.96

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	8	$193.52
Materials						
2 Drum Spill Pallet, 66 Gallon	1610	Pre fabricated containment basin with a capacity of approximately 66 gal. Materials only.	Each	$265.24	1	$265.24
PVC Containment Basin, 6' x 6'	1611	Poly containment basin typically 8 in. to 12 in. deep with area dimensions in the range of 6' x 6' or larger.	Square Feet	$19.20	64	$1,228.80

Practice: 309 - Agrichemical Handling Facility

Scenario: #7 - Existing Building, Addition of Storage With Handling Pad

Scenario Description:

This practice scenario is an agrichemical handling facility for storage and mixing and loading operations. This practice addresses water quality degradation and due to mis-handling, storing and mixing of agrichemicals where nutrients and/or chemicals are running off into surface waters or leaching into ground water. Associated practices: Heavy Use Area Protection (561), Diversion (362), Access Road (560), Pipeline (516), Roof Runoff Management (558), Pumping Plant for Water Control (533), Nutrient Management (590), Pest Management (595)

Before Situation:

Agrichemicals are improperly stored on the ground or next to a well. Operator mixes the agrichemicals and fills the sprayer tank next to a hydrant. Spills or overflows of agrichemicals contaminate the soil, runoff to surface waters and leaching to ground water.

After Situation:

An agrichemical storage and handling facility is constructed inside an existing building. The average size of the agrichemical handling facility for storage and mixing and loading is 24 ft x 36 ft with an application equipment length of 30 ft. The handling pad for mixing and loading operations is sized to contain the length of the agrichemical spray tank and its volume. Install a curbed reinforced concrete handling pad for mixing and loading with proper storage of associated dry and/or liquid agrichemicals. The concrete is sealed and sloped to a collection sump, facility containment is surrounded by square and ramped curbs and independent of the existing building. This practice will contain agrichemicals and prevent contamination of surface and ground water resources.

Feature Measure: Total Containment Area

Scenario Unit: Square Feet

Scenario Typical Size: 864.0

Scenario Total Cost: $12,545.28

Scenario Cost/Unit: $14.52

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$372.36	14	$5,213.04
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$494.40	8	$3,955.20
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.89	4	$203.56
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.72	10	$507.20
Demolition, concrete	1498	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yards	$11.03	7	$77.21
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	16	$387.04
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	10	$264.60
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	4	$134.56
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic Yards	$28.74	14	$402.36
Painting, porous surface, impermeable	1497	Painting of concrete, foam or other porous surfaces with an impermeable coating. Includes materials and application.	Square Feet	$1.00	864	$864.00
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	1	$65.09
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 311 - Alley Cropping

Scenario: #248 - Alley Cropping-single row

Scenario Description:

The crop or grass land is planted with rows of trees to increase crop diversity. Final row width, and spacing of trees within the row, is based on farm equipment size, growth form of trees, light needs of annual crop or grass, and intent of the landowner. The resource concerns are plant condition - inadequate structure and composition.

Before Situation:

The landscape has been cropped or in perennial grass for many years. It is void of any perennial tree vegetation. On cropland site preparation needs may need deep ripping to eliminate any plow pan and on grass land competing vegetation control is accomplished prior to tree planting.

After Situation:

Trees have been established to diversify the crop production of the field. Typically the area planted is 10 acres on approximately 12 x 40 foot spacing.

Feature Measure: planted seedling

Scenario Unit: Each

Scenario Typical Size: 900.0

Scenario Total Cost: $30,943.57

Scenario Cost/Unit: $34.38

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hours	$11.75	80	$940.00
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	4	$89.16
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$46.88	90	$4,219.20
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	180	$4,354.20
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	80	$2,116.80
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	20	$906.80
Materials						
Tree, Hardwood, Potted, Medium	1532	Potted hardwood seedling, 2 gallons or larger. Includes materials and shipping only.	Each	$14.60	910	$13,286.00
Tree shelter, solid tube type, 5 in. x 48 in.	1571	5 inch x 48 inch tree tube for protection from animal damage. Materials only.	Each	$3.71	910	$3,376.10
Cable ties, plastic	1575	Plastic cable ties (typ. 8-12 in.) to assist in securing items. Materials only.	Each	$0.06	910	$54.60
Stakes, wood, 3/4 in. x 3/4 in. x 60 in.	1583	3/4 in. x 3/4 in. x 60 in. wood stakes to fasten items in place. Includes materials only.	Each	$1.50	910	$1,365.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 313 - Waste Storage Facility

Scenario: #1 - Earthen Storage Facility, less than 50K ft3 Storage

Scenario Description:

An earthen waste impoundment constructed to store wastes such as manure, wastewater, and contaminated runoff as part of an agricultural waste management system. This scenario has a design storage volume of less than 50,000 ft3. This practice will address soil and water quality by reducing the pollution potential for surface water and groundwater quality degradation. Earthen storage liners are addressed with another standard. Vehicular and equipment access is addressed in Heavy Use Area Protection (561) to adequately protect liner at agitation and access points. Potential Associated Practices: Pond Sealing or Lining, Bentonite Sealant (521C), Pond Sealing or Lining, Compacted Clay Treatment (521D), Pond Sealing or Lining, Flexible Membrane (521A), Pond Sealing or Lining, Soil Dispersant (521B), Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Roofs and Covers (367), and Waste Separation Facility (632), Waste Treatment (629) .

Before Situation:

Operator presently has a confined animal feeding operation without a waste management system adequate to handle the waste stream leaving the animal production facilities. Manure and other agricultural waste by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or are being transported but not properly utilized or disposed. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources.

After Situation:

An earthen storage structure constructed from on-site material provides an environmentally safe facility for storing manure and other agricultural waste by-products. This facility provides the landowner a means of storing waste until it can be utilized in a proper manner in accordance with a nutrient management plan. Typical design size : design storage volume 25,000 ft3; 87'X87' (top); 3:1 inside and outside side slopes; cut/fill ratio = 1.25; total depth = 9.5' (design depth = 8'); (not inclued in volume - 1' freeboard and 0.5' sludge accumulation).

Feature Measure: Design Storage Volume

Scenario Unit: Cubic Feet

Scenario Typical Size: 25,000.0

Scenario Total Cost: $8,385.72

Scenario Cost/Unit: $0.34

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	806	$3,377.14
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.42	578	$1,976.76
Stripping and stockpiling, topsoil	1199	Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor.	Cubic Yards	$0.87	224	$194.88
Excavation, common earth, large equipment, 150 ft	1223	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yards	$3.64	582	$2,118.48
Materials						
Structural steel tubing, 2 in. diameter	1120	Structural steel tubing, 2 inch diameter, 1/8 inch wall thickness, materials only	Feet	$4.09	8	$32.72
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	1	$450.03

Practice: 313 - Waste Storage Facility

Scenario: #2 - Earthen Storage Facility, greater than 50K ft3 Storage

Scenario Description:

An earthen waste impoundment constructed to store wastes such as manure, wastewater, and contaminated runoff as part of an agricultural waste management system. This scenario has a design storage volume of more than 50,000 ft3. This practice will address soil and water quality by reducing the pollution potential for surface water and groundwater quality degradation. Earthen storage liners are addressed with another standard. Vehicular and equipment access is addressed in Heavy Use Area Protection (561) to adequately protect liner at agitation and access points. Potential Associated Practices: Pond Sealing or Lining, Bentonite Sealant (521C), Pond Sealing or Lining, Compacted Clay Treatment (521D), Pond Sealing or Lining, Flexible Membrane (521A), Pond Sealing or Lining, Soil Dispersant (521B), Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Roofs and Covers (367), and Waste Separation Facility (632), Waste Treatment (629).

Before Situation:

Operator presently has a confined animal feeding operation without a waste management system adequate to handle the waste stream leaving the animal production facilities. Manure and other agricultural waste by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or are being transported but not properly utilized or disposed. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources.

After Situation:

An earthen storage structure constructed from on-site material provides an environmentally safe facility for storing manure and other agricultural waste by-products. This facility provides the landowner a means of storing waste until it can be utilized in a proper manner in accordance with a nutrient management plan. Typical design size: design storage volume 168,000 ft3; 157'X162' (top); 3:1 inside and outside side slopes; cut/fill ratio = 1.25; total depth = 13' 8" (design depth = 12'); (not inclued in volume - 1' freeboard and 8" sludge accumulation).

Feature Measure: Design Storage Volume

Scenario Unit: Cubic Feet

Scenario Typical Size: 168,000.0

Scenario Total Cost: $44,153.42

Scenario Cost/Unit: $0.26

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	4375	$18,331.25
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.42	3284	$11,231.28
Stripping and stockpiling, topsoil	1199	Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor.	Cubic Yards	$0.87	741	$644.67
Excavation, common earth, large equipment, 150 ft	1223	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yards	$3.64	3634	$13,227.76
Materials						
Structural steel tubing, 2 in. diameter	1120	Structural steel tubing, 2 inch diameter, 1/8 inch wall thickness, materials only	Feet	$4.09	8	$32.72
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	1	$450.03

Practice: 313 - Waste Storage Facility

Scenario: #3 - Earthen Storage Facility, High Water Table

Scenario Description:

An earthen waste impoundment constructed to store wastes such as manure, wastewater, and contaminated runoff as part of an agricultural waste management system. Due to high watertable conditions, the earthen embankment is constructed on the soil surface. Earthfill is obtained within five miles off-site. This practice will address soil and water quality by reducing the pollution potential for surface water and groundwater quality degradation. Earthen storage liners are addressed with another standard. Vehicular and equipment access is addressed in Heavy Use Area Protection (561) to adequately protect liner at agitation and access points. Potential Associated Practices: Pond Sealing or Lining, Bentonite Sealant (521C), Pond Sealing or Lining, Compacted Clay Treatment (521D), Pond Sealing or Lining, Flexible Membrane (521A), Pond Sealing or Lining, Soil Dispersant (521B), Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Waste Separation Facility (632), Waste Treatment (629), Subsurface Drain (606), and Underground Outlet (620).

Before Situation:

Operator presently has a confined animal feeding operation without a waste management system adequate to handle the waste stream leaving the animal production facilities. Manure and other agricultural waste by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or are being transported but not properly utilized or disposed. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources.

After Situation:

An earthen storage structure constructed from on-site material provides an environmentally safe facility for storing manure and other agricultural waste by-products. This facility provides the landowner a means of storing waste until it can be utilized in a proper manner in accordance with a nutrient management plan. Typical design size: design storage volume 121,200 ft3; 150'X150' (top); 3:1 inside and outside side slopes; embankment topwidth = 10'; compaction ratio = 1.1; total depth = 10' (design depth = 8.5'); (not inclued in volume - 1' freeboard and 0.5' sludge accumulation); embankment volume = 4*160*((10+70)/2)*10*1.1

Feature Measure: Design Storage Volume

Scenario Unit: Cubic Feet

Scenario Typical Size: 121,200.0

Scenario Total Cost: $145,429.33

Scenario Cost/Unit: $1.20

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	10430	$43,701.70
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.42	10430	$35,670.60
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hours	$120.60	97	$11,698.20
Stripping and stockpiling, topsoil	1199	Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor.	Cubic Yards	$0.87	741	$644.67
Excavation, common earth, large equipment, 150 ft	1223	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yards	$3.64	9689	$35,267.96
Hauling, bulk, highway truck	1615	Hauling of bulk earthfill, rockfill, waste or debris. One-way travel distance using fully loaded highway dump trucks (typically 16 CY or 20 TN capacity). Includes equipment and labor for truck only. Does not include cost for loading truck.	Cubic Yard Mile	$0.28	48445	$13,564.60
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	97	$3,263.08
Materials						
Structural steel tubing, 2 in. diameter	1120	Structural steel tubing, 2 inch diameter, 1/8 inch wall thickness, materials only	Feet	$4.09	8	$32.72
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	3	$1,350.09

Practice: 313 - Waste Storage Facility

Scenario: #4 - Above Ground Steel or Concrete, less than 25K ft3 storage

Scenario Description:

An above ground circular glass lined steel or concrete structure constructed to store wastes such as manure, wastewater, and contaminated runoff as part of an agricultural waste management system. This scenario has a design storage volume of less than 25,000 ft3. This practice will address soil and water quality by reducing the pollution potential for surface water and groundwater quality degradation. Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Waste Separation Facility (632), Waste Treatment (629), and Pumping Plant (533).

Before Situation:

Operator presently has a confined animal feeding operation without a waste management system adequate to handle the waste stream leaving the animal production facilities. Manure and other agricultural waste by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or are being transported but not properly utilized or disposed. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources.

After Situation:

An above ground storage structure provides an environmentally safe facility for storing manure and other agricultural waste by-products. This facility provides the landowner a means of storing waste until it can be utilized in a proper manner in accordance with a nutrient management plan. Typical design size : design storage volume 14,000 ft3; based on 31' X 19' glass lined steel tank (based on Slurrystore table).

Feature Measure: Design Storage Volume

Scenario Unit: Cubic Feet

Scenario Typical Size: 14,000.0

Scenario Total Cost: $109,701.11

Scenario Cost/Unit: $7.84

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$494.40	28.5	$14,090.40
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	80	$166.40
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	80	$335.20
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	21.5	$646.51
Structural steel tubing, 2 in. diameter	1120	Structural steel tubing, 2 inch diameter, 1/8 inch wall thickness, materials only	Feet	$4.09	20	$81.80
Waste Storage, Glass lined steel structure (<25,000 ft3)	1616	Includes materials, equipment and labor to install 31' (diameter) X19' (height) steel lined structure. Includes materials, equipment and labor.	Cubic Feet	$6.72	14000	$94,080.00
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	1	$65.09
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 313 - Waste Storage Facility

Scenario: #5 - Above Ground Steel or Concrete, between 25 and100K ft3 storage

Scenario Description:

An above ground circular glass lined steel or concrete structure constructed to store wastes such as manure, wastewater, and contaminated runoff as part of an agricultural waste management system. This scenario has a design storage volume of between 25,000 and 100,000 ft3. This practice will address soil and water quality by reducing the pollution potential for surface water and groundwater quality degradation. Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Waste Separation Facility (632), Waste Treatment (629), and Pumping Plant (533).

Before Situation:

Operator presently has a confined animal feeding operation without a waste management system adequate to handle the waste stream leaving the animal production facilities. Manure and other agricultural waste by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or are being transported but not properly utilized or disposed. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources.

After Situation:

An above ground storage structure provides an environmentally safe facility for storing manure and other agricultural waste by-products. This facility provides the landowner a means of storing waste until it can be utilized in a proper manner in accordance with a nutrient management plan. Typical design size : design storage volume 78,000 ft3; based on 73' X 19' glass lined steel tank (based on Slurrystore table).

Feature Measure: Design Storage Volume

Scenario Unit: Cubic Feet

Scenario Typical Size: 78,000.0

Scenario Total Cost: $263,042.81

Scenario Cost/Unit: $3.37

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$494.40	104	$51,417.60
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	250	$520.00
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	250	$1,047.50
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	73	$2,195.11
Structural steel tubing, 2 in. diameter	1120	Structural steel tubing, 2 inch diameter, 1/8 inch wall thickness, materials only	Feet	$4.09	20	$81.80
Waste Storage, glass lined steel structure, 25,000 - 100,000 cubic foot	1620	Includes materials, equipment and labor to install a steel glass lined structure (based on typical 73' diameter X 19' height) . Includes materials, equipment and labor.	Cubic Feet	$2.66	78000	$207,480.00
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	1	$65.09
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 313 - Waste Storage Facility

Scenario: #6 - Above Ground Steel or Concrete, between 100 and 200K ft3 storage

Scenario Description:

An above ground circular glass lined steel or concrete structure constructed to store wastes such as manure, wastewater, and contaminated runoff as part of an agricultural waste management system. This scenario has a design storage volume of between 100,000 and 200,000 ft3. This practice will address soil and water quality by reducing the pollution potential for surface water and groundwater quality degradation. Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Waste Separation Facility (632), Waste Treatment (629), and Pumping Plant (533).

Before Situation:

Operator presently has a confined animal feeding operation without a waste management system adequate to handle the waste stream leaving the animal production facilities. Manure and other agricultural waste by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or are being transported but not properly utilized or disposed. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources.

After Situation:

An above ground storage structure provides an environmentally safe facility for storing manure and other agricultural waste by-products. This facility provides the landowner a means of storing waste until it can be utilized in a proper manner in accordance with a nutrient management plan. Typical design size : design storage volume 184,800 ft3; based on 112' X 19' glass lined steel tank (based on Slurrystore table).

Feature Measure: Design Storage Volume

Scenario Unit: Cubic Feet

Scenario Typical Size: 184,800.0

Scenario Total Cost: $479,050.18

Scenario Cost/Unit: $2.59

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$494.40	211	$104,318.40
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	470	$1,969.30
Excavation, common earth, large equipment, 150 ft	1223	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yards	$3.64	470	$1,710.80
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	143.5	$4,315.05
Structural steel tubing, 2 in. diameter	1120	Structural steel tubing, 2 inch diameter, 1/8 inch wall thickness, materials only	Feet	$4.09	20	$81.80
Waste Storage, glass lined steel structure, 100,000-200,000 cubic foot	1621	Includes materials, equipment and labor to install a steel glass lined structure (based on typical 112' diameter X 19' height) . Includes materials, equipment and labor.	Cubic Feet	$1.98	184800	$365,904.00
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	1	$65.09
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	1	$450.03

Practice: 313 - Waste Storage Facility

Scenario: #7 - Above Ground Steel or Concrete, greater than 200K ft3 storage

Scenario Description:

An above ground circular glass lined steel or concrete structure constructed to store wastes such as manure, wastewater, and contaminated runoff as part of an agricultural waste management system. This scenario has a design storage volume of greater than 200,000 ft3. This practice will address soil and water quality by reducing the pollution potential for surface water and groundwater quality degradation. Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Waste Separation Facility (632), Waste Treatment (629), and Pumping Plant (533).

Before Situation:

Operator presently has a confined animal feeding operation without a waste management system adequate to handle the waste stream leaving the animal production facilities. Manure and other agricultural waste by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or are being transported but not properly utilized or disposed. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources.

After Situation:

An above ground storage structure provides an environmentally safe facility for storing manure and other agricultural waste by-products. This facility provides the landowner a means of storing waste until it can be utilized in a proper manner in accordance with a nutrient management plan. Typical design size : design storage volume 244,500 ft3; based on 129' X 19' glass lined steel tank (based on the Slurrystore tables).

Feature Measure: Design Storage Volume

Scenario Unit: Cubic Feet

Scenario Typical Size: 244,500.0

Scenario Total Cost: $618,666.02

Scenario Cost/Unit: $2.53

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$494.40	270	$133,488.00
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	584	$2,446.96
Excavation, common earth, large equipment, 150 ft	1223	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yards	$3.64	584	$2,125.76
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	181	$5,442.67
Structural steel tubing, 2 in. diameter	1120	Structural steel tubing, 2 inch diameter, 1/8 inch wall thickness, materials only	Feet	$4.09	20	$81.80
Waste Storage, glass lined steel structure >200,000 cubic foot	1622	Includes materials, equipment and labor to install a steel glass lined structure (based on typical 129' diameter X 19' height) . Includes materials, equipment and labor.	Cubic Feet	$1.94	244500	$474,330.00
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	1	$65.09
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	1	$450.03

Practice: 313 - Waste Storage Facility

Scenario: #8 - Drystack, earthen floor, no wall

Scenario Description:

This scenario consists of a dry stack facility with compacted earthen floor without side walls. This scenario is intended for dryer material such as poultry litter. The purpose of this practice is to properly store manure and other agricultural by-products until they can be hauled away from the site for proper disposal or utilization on land at agronomical rates. This scenario is applicable when geological, soil, and climate conditions are appropriate for earth floors and are allowed by state and local regulations. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Potential Associated practices: 342-Critical Area Planting, 362-Diversion, 561-Heavy Use Area Protection, 367-Roofs and Covers, 558-Roof Runoff Structure, 317-Composting Facility, 633-Waste Recycling, 634-Waste Transfer, 635-Vegetated Treatment Area

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

After Situation:

Manure and other agricultural by-products are being controlled, by the collection at the source, and stored temporarily, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan. The typical is 4,000 SqFt (40' x 100'). The earthen floor will be prepared by stripping the top 1' of soil and roller compacting it back into floor.

Feature Measure: Square Foot Floor Area

Scenario Unit: Square Feet

Scenario Typical Size: 4,000.0

Scenario Total Cost: $2,058.90

Scenario Cost/Unit: $0.51

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	148	$620.12
Excavation, common earth, large equipment, 150 ft	1223	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yards	$3.64	148	$538.72
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	2	$900.06

Practice: 313 - Waste Storage Facility

Scenario: #9 - Dry stack, earthen floor, wood or concrete wall

Scenario Description:

This scenario consists of a dry stack facility with compacted earthen floor with wooden walls, posts and a concrete curb. This scenario is intended for dryer material such as poultry litter. The purpose of this practice is to properly store manure and other agricultural by-products until they can be hauled away from the site for proper disposal or utilization on land at agronomical rates. This scenario is applicable when geological, soil, and climate conditions are appropriate for earth floors and are allowed by state and local regulations.This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Potential Associated practices: 342-Critical Area Planting, 362-Diversion, 561-Heavy Use Area Protection, 367-Roofs and Covers, 558-Roof Runoff Structure, 317-Composting Facility, 633-Waste Recycling, 634-Waste Transfer, 635-Vegetated Treatment Area

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

After Situation:

Manure and other agricultural by-products are being controlled, by the collection at the source, and stored temporarily, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan. The typical is 4,000 SqFt (40' x 100'). The earthen floor will be prepared by stripping the top 1' of soil and roller compacting it back into floor. Walls are 5' pressure treated wood (2" x 8" boards), 6" x 6" x 8' posts set 4' c-c with 6" concrete curbing. Walls allow for greater storage volume. (Wood walls are 4.5' with 0.5' high concrete curbing.) Walls are along three sides of the facility (both short dimensions and one long dimension). Site preparation includes excavation and compaction of top 1' of material, setting posts, and installing curbing and wooden walls.

Feature Measure: Square Foot Floor Area

Scenario Unit: Square Feet

Scenario Typical Size: 4,000.0

Scenario Total Cost: $11,712.74

Scenario Cost/Unit: $2.93

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formless, non reinforced	36	Non reinforced concrete cast-in-placed without forms by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$184.90	5.5	$1,016.95
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$494.40	2	$988.80
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	148	$620.12
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.72	12	$608.64
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hours	$11.75	12	$141.00
Excavation, common earth, large equipment, 150 ft	1223	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yards	$3.64	148	$538.72
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	90	$2,177.10
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	12	$317.52
Materials						
Dimension Lumber, Treated	1044	Treated dimension lumber with nominal thickness equal or less than 2". Includes lumber and fasteners	Board Feet	$1.14	1620	$1,846.80
Lumber, planks, posts and timbers, treated	1609	Treated dimension lumber with nominal thickness greater than 2". Includes lumber and fasteners. Does not include labor.	Board Feet	$1.97	1104	$2,174.88
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	1	$65.09
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	2	$317.06

Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	2	$900.06

Practice: 313 - Waste Storage Facility

Scenario: #10 - Dry Stack, concrete floor, no wall

Scenario Description:

This scenario consists of a dry stack facility with reinforced concrete floor without side walls. This scenario is applicable when geological, soil, climate conditions or state and local regulations prohibit the use of an earthen surface, and requires a hard working surface such as concrete. The purpose of this practice is to properly store manure and other agricultural by-products until they can be hauled away from the site for proper disposal or utilization on land at agronomical rates. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Potential Associated practices: 342-Critical Area Planting, 362-Diversion, 561-Heavy Use Area Protection, 367-Roofs and Covers, 558-Roof Runoff Structure, 317-Composting Facility, 633-Waste Recycling, 634-Waste Transfer, 635-Vegetated Treatment Area

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

After Situation:

Manure and other agricultural by-products are being controlled, by the collection at the source, and stored temporarily, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan. The typical is 4,000 SqFt (40' x 100'). The facility floor is 5" reinforced concrete without side walls. Site preparation includes topsoil removal (0.5'), placement of compacted gravel (4"), and installing 5" of reinforced concrete.

Feature Measure: Square Foot Floor Area

Scenario Unit: Square Feet

Scenario Typical Size: 4,000.0

Scenario Total Cost: $25,294.18

Scenario Cost/Unit: $6.32

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$372.36	62	$23,086.32
Excavation, common earth, large equipment, 150 ft	1223	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yards	$3.64	74	$269.36
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	49.5	$1,488.47
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	1	$450.03

Practice: 313 - Waste Storage Facility

Scenario: #11 - Dry Stack, concrete floor, wood or concrete wall

Scenario Description:

This scenario consists of a dry stack facility with reinforced concrete Floor with pressure treated wood or concrete walls. This scenario is applicable when geological, soil, climate conditions or state and local regulations prohibit the use of an earthen surface, and requires a hard working surface such as concrete. The purpose of this practice is to temporarily, properly store manure and other agricultural by-products until they can be hauled away from the site for proper disposal or utilization on land at agronomical rates. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Potential Associated practices: 342-Critical Area Planting, 362-Diversion, 561-Heavy Use Area Protection, 367-Roofs and Covers, 558-Roof Runoff Structure, 317-Composting Facility, 633-Waste Recycling, 634-Waste Transfer, 635-Vegetated Treatment Area

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

After Situation:

Manure and other agricultural by-products are being controlled, by the collection at the source, and stored temporarily, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan. The typical is 4,000 SqFt (40' x 100') with wood walls. The facility floor is 5" reinforced concrete with 5' pressure treated wood (2" x 8" boards) walls, 6" x 6" x 8' posts set 4' c-c with 6" concrete curbing. Walls allow for greater storage volume. (Wood walls are 4.5' with 0.5' high concrete curbing.) Walls are along three sides of the facility (both short dimensions and one long dimension). Site preparation includes topsoil removal (0.5'), placement of compacted gravel (4"), installing 5" of reinforced concrete floor, setting posts, and installing curbing and wooden walls.

Feature Measure: Square Foot Floor Area

Scenario Unit: Square Feet

Scenario Typical Size: 4,000.0

Scenario Total Cost: $34,948.02

Scenario Cost/Unit: $8.74

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formless, non reinforced	36	Non reinforced concrete cast-in-placed without forms by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$184.90	5.5	$1,016.95
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$372.36	62	$23,086.32
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$494.40	2	$988.80
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.72	12	$608.64
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hours	$11.75	12	$141.00
Excavation, common earth, large equipment, 150 ft	1223	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yards	$3.64	74	$269.36
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	90	$2,177.10
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	12	$317.52
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	49.5	$1,488.47
Dimension Lumber, Treated	1044	Treated dimension lumber with nominal thickness equal or less than 2". Includes lumber and fasteners	Board Feet	$1.14	1620	$1,846.80
Lumber, planks, posts and timbers, treated	1609	Treated dimension lumber with nominal thickness greater than 2". Includes lumber and fasteners. Does not include labor.	Board Feet	$1.97	1104	$2,174.88
Mobilization						

Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	1	$65.09
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	2	$317.06
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	1	$450.03

Practice: 313 - Waste Storage Facility

Scenario: #12 - Concrete Tank, Buried, less than 5K

Scenario Description:

This scenario consists of installing a small concrete tank with a design storage volume of less than 5,000 CF that is totally or partially buried and has a solid lid with several openings for direct loading from a heavy use area, gutter cleaner or gravity pipe. Manure is held for 3 to 14 days on smaller operations or transfered to larger storage facility or direct land applied. Design volume does not include freeboard. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Waste Separation Facility (632), Diversion (362), Subsurface Drain (606), Pumping Plant (533),and Underground Outlet (620).

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

After Situation:

Manure and other agricultural by-products are being controlled, by the collection at the source, and stored temporarily, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Tank typically 8' deep x 12' wide x 40' long, with a design storage volume of 3,600 cubic feet plus 6" freeboard and conrete top. Sizing based on manure, other wastes, rainfall, lot runoff, etc. Volume does not include 6" of freeboard. Tanks associated with open lots sized to handle design storm in tank or in combination with lot as per state regulations. Site preparation includes excavation of tank footprint, placement of compacted gravel (5"), pouring concrete floor, walls and top, and backfilling around the tank.

Feature Measure: Design Storage Volume

Scenario Unit: Cubic Feet

Scenario Typical Size: 3,600.0

Scenario Total Cost: $26,691.75

Scenario Cost/Unit: $7.41

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$372.36	8	$2,978.88
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$494.40	36	$17,798.40
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$5.40	213	$1,150.20
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.42	163	$557.46
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$100.83	19	$1,915.77
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	19	$639.16
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	9	$270.63
Waterstop, PVC, ribbed, 3/16 in x 6 in	1614	Waterstop, PVC, ribbed, 3/16 inch thick by 6 inches wide. Includes materials, equipment and labor.	Feet	$4.81	104	$500.24
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	3	$195.27
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	1	$450.03

Practice: 313 - Waste Storage Facility

Scenario: #13 - Concrete Tank, Buried, between 5K and 15K

Scenario Description:

This scenario consists of installing a concrete tank that has a design storage volume from 5,000 to 14,999 CF that is totally or partially buried and has an open top. The tank can also be under an animal facility with the top cover of either slats or solid concrete lid/floor. Design volume does not include freeboard. Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Waste Separation Facility (632), Diversion (362), Subsurface Drain (606), and Underground Outlet (620).

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

After Situation:

Manure and other agricultural by-products are being controlled, by the collection at the source, and stored temporarily, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Tank typically 8' deep, with a bottom area of 1256 SF, and a design storage volume of 9,420 cubic feet plus 6" freeboard (40' diameter). (6.5' excavation depth with 8" wall thickness.) Sizing based on manure, other wastes, rainfall, lot runoff, etc. as appropriate. Volume does not include 6" of freeboard. Site preparation includes excavation of tank footprint, placement of compacted gravel (5"), pouring concrete floor and wall, and backfilling around the tank.

Feature Measure: Design Storage Volume

Scenario Unit: Cubic Feet

Scenario Typical Size: 9,420.0

Scenario Total Cost: $28,531.33

Scenario Cost/Unit: $3.03

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$372.36	22	$8,191.92
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$494.40	26	$12,854.40
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$5.40	162	$874.80
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.42	323	$1,104.66
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$100.83	25	$2,520.75
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	25	$841.00
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	22	$661.54
Waterstop, PVC, ribbed, 3/16 in x 6 in	1614	Waterstop, PVC, ribbed, 3/16 inch thick by 6 inches wide. Includes materials, equipment and labor.	Feet	$4.81	125	$601.25
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	3	$195.27
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	1	$450.03

Practice: 313 - Waste Storage Facility

Scenario: #14 - Concrete Tank, Buried, between 15K and 25K

Scenario Description:

This scenario consists of installing a concrete tank that has a design storage volume from 15,000 to 24,999 CF. The tank is totally or partially buried and has an open top. It can be under an animal facility with the top cover being slats or concrete lid/floor. The design volume does not include freeboard. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Waste Separation Facility (632), Diversion (362), Subsurface Drain (606), Pumping Plant (533) and Underground Outlet (620).

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

After Situation:

Manure and other agricultural by-products are being controlled, by the collection at the source, and stored temporarily, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Tank is typically 8 ft deep, with a bottom area of 2,667 sq.ft., and a design storage volume of 20,000 cubic feet plus 6” freeboard (58.5' diameter). (6.5' excavation depth with 8" wall thickness.) Size based on design volume of manure, other wastes, rainfall, lot runoff, etc as appropriate and does not include the 6” of freeboard. Site preparation includes excavation of tank footprint, placement of compacted gravel (5"), pouring concrete floor and wall, and backfilling around the tank.

Feature Measure: Design Storage Volume

Scenario Unit: Cubic Feet

Scenario Typical Size: 20,000.0

Scenario Total Cost: $47,894.96

Scenario Cost/Unit: $2.39

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$372.36	45	$16,756.20
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$494.40	37	$18,292.80
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$5.40	227	$1,225.80
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.42	677	$2,315.34
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$100.83	46	$4,638.18
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	46	$1,547.44
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	45	$1,353.15
Waterstop, PVC, ribbed, 3/16 in x 6 in	1614	Waterstop, PVC, ribbed, 3/16 inch thick by 6 inches wide. Includes materials, equipment and labor.	Feet	$4.81	184	$885.04
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	3	$195.27
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	1	$450.03

Practice: 313 - Waste Storage Facility

Scenario: #15 - Concrete Tank, Buried, between 25K and 50K

Scenario Description:

This scenario consists of installing a concrete tank that has a design storage volume from 25,000 to 49,999 CF. Tank is totally or partially buried and has an open top. Tank can be under a animal facility with the top cover being slats or concrete lid/floor. The design volume does not include freeboard. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Waste Separation Facility (632), Diversion (362), Subsurface Drain (606), and Underground Outlet (620).

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

After Situation:

Manure and other agricultural by-products are being controlled, by the collection at the source, and stored temporarily, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Tank installed is 10' deep, with a bottom area of 2,947 SF, and a design storage volume of 28,000 cubic feet plus 6" freeboard (61.3' diameter). (8' excavation depth with 8" wall thickness.) Size based on manure, other wastes, rainfall, lot runoff, etc as appropriate. Calculated volume for scenario does not include the 6” of freeboard. Site preparation includes excavation of tank footprint, placement of compacted gravel (5"), pouring concrete floor and wall, and backfilling around the tank.

Feature Measure: Design Storage Volume

Scenario Unit: Cubic Feet

Scenario Typical Size: 28,000.0

Scenario Total Cost: $55,028.09

Scenario Cost/Unit: $1.97

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$372.36	49	$18,245.64
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$494.40	48	$23,731.20
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$5.40	334	$1,803.60
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.42	922	$3,153.24
Excavation, common earth, large equipment, 150 ft	1223	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yards	$3.64	1263	$4,597.32
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	49	$1,473.43
Waterstop, PVC, ribbed, 3/16 in x 6 in	1614	Waterstop, PVC, ribbed, 3/16 inch thick by 6 inches wide. Includes materials, equipment and labor.	Feet	$4.81	193	$928.33
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	3	$195.27
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	2	$900.06

Practice: 313 - Waste Storage Facility

Scenario: #16 - Concrete Tank, Buried, between 50K and 75K

Scenario Description:

This scenario consists of installing a concrete tank that has a design storage volume from 50,000 to 74,999 CF. Tank is totally or partially buried and has an open top, however it can be under a animal facility with the top cover with slats or concrete lid/floor. The design volume does not include freeboard. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Waste Separation Facility (632), Diversion (362), Subsurface Drain (606), and Underground Outlet (620).

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

After Situation:

Manure and other agricultural by-products are being controlled, by the collection at the source, and stored temporarily, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Tank typically 12' deep, with a bottom area of 5,391 SF, and a design storage volume of 62,000 cubic feet plus 6" freeboard (82.9' diameter). (10' excavation depth with 10" wall thickness.) Sizing based on manure, other wastes, rainfall, lot runoff, etc. as appropriate. Volume does not include 6" of freeboard. Site preparation includes excavation of tank footprint, placement of compacted gravel (5"), pouring concrete floor and wall, and backfilling around the tank.

Feature Measure: Design Storage Volume

Scenario Unit: Cubic Feet

Scenario Typical Size: 62,000.0

Scenario Total Cost: $106,926.99

Scenario Cost/Unit: $1.72

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$372.36	88	$32,767.68
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$494.40	98	$48,451.20
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$5.40	661	$3,569.40
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.42	2078	$7,106.76
Excavation, common earth, large equipment, 150 ft	1223	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yards	$3.64	2739	$9,969.96
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	88	$2,646.16
Waterstop, PVC, ribbed, 3/16 in x 6 in	1614	Waterstop, PVC, ribbed, 3/16 inch thick by 6 inches wide. Includes materials, equipment and labor.	Feet	$4.81	261	$1,255.41
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	4	$260.36
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	2	$900.06

Practice: 313 - Waste Storage Facility

Scenario: #17 - Concrete Tank, Buried, between 75K and 110K

Scenario Description:

This scenario consists of installing a concrete tank that has a design storage volume from 75,000 to 109,999 CF. Tank is totally or partially buried and has an open top. Tank can also be under an animal facility with the top cover using slats or concrete lid/floor. The design volume does not include freeboard. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Waste Separation Facility (632), Diversion (362), Pipeline (516), Subsurface Drain (606), and Underground Outlet (620).

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

After Situation:

Manure and other agricultural by-products are being controlled, by the collection at the source, and stored temporarily, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Tank typically 12' deep, with a bottom area of 8,044 SF, and a design storage capacity of 92,500 cubic feet plus 6" freeboard (101.2' diameter). (10' excavation depth with 10" wall thickness.) Sizing based on manure, other wastes, rainfall, lot runoff, etc. as appropriate. Volume does not include 6" of freeboard. Site preparation includes excavation of tank footprint, placement of compacted gravel (5"), pouring concrete floor and wall, and backfilling around the tank.

Feature Measure: Design Storage Volume

Scenario Unit: Cubic Feet

Scenario Typical Size: 92,500.0

Scenario Total Cost: $142,395.62

Scenario Cost/Unit: $1.54

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$372.36	129	$48,034.44
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$494.40	119	$58,833.60
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$5.40	790	$4,266.00
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.42	3081	$10,537.02
Excavation, common earth, large equipment, 150 ft	1223	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yards	$3.64	3871	$14,090.44
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	129	$3,879.03
Waterstop, PVC, ribbed, 3/16 in x 6 in	1614	Waterstop, PVC, ribbed, 3/16 inch thick by 6 inches wide. Includes materials, equipment and labor.	Feet	$4.81	318	$1,529.58
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	5	$325.45
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	2	$900.06

Practice: 313 - Waste Storage Facility

Scenario: #18 - Concrete Tank, Buried, greater than 110K

Scenario Description:

This scenario consists of installing a concrete tank that has a design storage volume of 110, 000 or more CF. Tank is totally or partially buried and has an open top. Tank can also be under a animal facility with the top cover using slats or concrete lid/floor. The design volume does not include freeboard. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Waste Separation Facility (632), Diversion (362), Pipeline (516), Subsurface Drain (606), and Underground Outlet (620).

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

After Situation:

Manure and other agricultural by-products are being controlled, by the collection at the source, and stored temporarily, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Tank typically 14' deep with a bottom area of 11,304 SF and a design storage volume of 152,600 CF plus 6" freeboard (120' diameter). (12' excavation depth with 10" wall thickness.) Sizing based on manure, other wastes, rainfall, lot runoff, etc. as appropriate. Volume does not include 6" of freeboard. Site preparation includes excavation of tank footprint, placement of compacted gravel (5"), pouring concrete floor and wall, and backfilling around the tank.

Feature Measure: Design Storage Volume

Scenario Unit: Cubic Feet

Scenario Typical Size: 152,600.0

Scenario Total Cost: $218,718.72

Scenario Cost/Unit: $1.43

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$372.36	217	$80,802.12
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$494.40	164	$81,081.60
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$5.40	1304	$7,041.60
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.42	5170	$17,681.40
Excavation, common earth, large equipment, 150 ft	1223	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yards	$3.64	6474	$23,565.36
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	181	$5,442.67
Waterstop, PVC, ribbed, 3/16 in x 6 in	1614	Waterstop, PVC, ribbed, 3/16 inch thick by 6 inches wide. Includes materials, equipment and labor.	Feet	$4.81	377	$1,813.37
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	6	$390.54
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	2	$900.06

Practice: 313 - Waste Storage Facility

Scenario: #19 - Composted Bedded Pack, Earthen Floor, Concrete Wall

Scenario Description:

A composted bedded pack facility is constructed to store wastes as part of an agricultural waste management system. This practice will address soil and water quality by reducing the pollution potential for surface water and groundwater quality degradation. Potential Associated Practices: Fence (382), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), and Roofs and Covers (367).

Before Situation:

Operator presently has a confined animal feeding operation without a waste management system adequate to handle the waste stream leaving the animal production facilities. Manure and other agricultural waste by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or are being transported but not properly utilized or disposed. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources.

After Situation:

Using a bedded pack provides an environmentally safe facility for storing manure and other agricultural waste by-products. This facility provides the landowner a means of storing waste until it can be utilized in a proper manner in accordance with a nutrient management plan. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Typical design: floor area 4,000 ft2 , (40' X 100'); 4' concrete wall height, 3' footing depth with an earthen floor; 20' openings on each end of structure. Site preparation includes excavation of bedded pack area and and concrete wall trench, recompaction of earthen floor, pouring concrete wall, and backfilling around the wall.

Feature Measure: Square Foot Floor Area

Scenario Unit: Square Feet

Scenario Typical Size: 4,000.0

Scenario Total Cost: $22,576.62

Scenario Cost/Unit: $5.64

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$494.40	42	$20,764.80
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	34	$70.72
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	74	$310.06
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$5.40	16	$86.40
Stripping and stockpiling, topsoil	1199	Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor.	Cubic Yards	$0.87	102	$88.74
Excavation, common earth, large equipment, 150 ft	1223	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yards	$3.64	74	$269.36
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	1	$65.09
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	1	$450.03

Practice: 313 - Waste Storage Facility

Scenario: #20 - Composted Bedded Pack, Concrete Floor, Concrete Wall

Scenario Description:

A composted bedded pack facility is constructed to store wastes such as manure, wastewater, and contaminated runoff as part of an agricultural waste management system. This scenario is intended for situations where consistency of manure or geological conditions prohibit the use of earthen floors. This practice will address soil and water quality by reducing the pollution potential for surface water and groundwater quality degradation. Potential Associated Practices: Fence (382), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561) and Roofs and Covers (367).

Before Situation:

Operator presently has a confined animal feeding operation without a waste management system adequate to handle the waste stream leaving the animal production facilities. Manure and other agricultural waste by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or are being transported but not properly utilized or disposed. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources.

After Situation:

Using a bedded pack provides an environmentally safe facility for storing manure and other agricultural waste by-products. This facility provides the landowner a means of storing waste until it can be utilized in a proper manner in accordance with a nutrient management plan. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Typical design: floor area 4,000 ft2, (40' X 100'); 4' concrete wall height, 3' footing depth with a 6" concrete floor; 20' openings on each end of structure. Site preparation includes excavation of bedded pack area and and concrete wall trench, gravel placement for concrete floor (4"), pouring concrete floor and wall, and backfilling around the wall.

Feature Measure: Square Foot Floor Area

Scenario Unit: Square Feet

Scenario Typical Size: 4,000.0

Scenario Total Cost: $51,088.99

Scenario Cost/Unit: $12.77

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$372.36	74	$27,554.64
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$494.40	42	$20,764.80
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	34	$70.72
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$5.40	16	$86.40
Stripping and stockpiling, topsoil	1199	Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor.	Cubic Yards	$0.87	102	$88.74
Excavation, common earth, large equipment, 150 ft	1223	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yards	$3.64	74	$269.36
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	50	$1,503.50
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	1	$65.09
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	1	$450.03

Practice: 314 - Brush Management

Scenario: #2 - Mechanical, Hand tools, Heavy

Scenario Description:

Using hand tools, such as axes, shovels, hoes, nippers, brush pullers, and including chainsaws to remove or cut off woody plants at or below the root collar. Typical area is moderate rolling to gentle sloping that have stands of woody species that are in the advanced phases of invasion.

Before Situation:

Area is in the very early phases of woody non herbaceous species encroachment that degrades habitat for desired wildlife species. Future degradation of key forage species and ecological site condition promoting noxious and invasive species and increased soil erosion if woody species are allowed to expand.

After Situation:

Woody species are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition continues to progressing in an upward trend, hydrology and plant health and vigor are sustained.

Feature Measure: Acres treated

Scenario Unit: Acres

Scenario Typical Size: 80.0

Scenario Total Cost: $9,870.07

Scenario Cost/Unit: $123.38

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.59	300	$1,977.00
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	2	$44.58
Pruning tools, hand tools	1318	Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included.	Hours	$2.13	20	$42.60
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	320	$7,740.80
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	1	$65.09

Practice: 314 - Brush Management

Scenario: #3 - Mechanical, Small Shrubs, Light Infestation

Scenario Description:

Removal of small woody vegetation of light infestations on gentle sloping to moderately deep to deep soils. The practice entails the removal of brush by the use of mechanical cutter, chopper or other light equipment in order to reduce fuel loading and improve ecological site condition. Brush density has exceeded desired levels based on ecological site potential. It has been determined that the brush is at a light infestation. Typical unit is 120 acres.

Before Situation:

Area consist of excessive stands of shrub species degrading health and vigor of native herbaceous species promoting noxious and invasive species and degrading wildlife habitat.

After Situation:

Woody species are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and improved wildlife habitat.

Feature Measure: Acres planned

Scenario Unit: Acres

Scenario Typical Size: 120.0

Scenario Total Cost: $8,414.03

Scenario Cost/Unit: $70.12

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	10	$222.90
Mechanical cutter, chopper	943	Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included.	Hours	$90.63	60	$5,437.80
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$18.46	30	$553.80
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	60	$1,587.60
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	10	$453.40
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53

Practice: 314 - Brush Management

Scenario: #4 - Mechanical, Small Shrubs, Medium Infestation

Scenario Description:

Removal of small woody vegetation of medium infestations on gentle sloping to moderately deep to deep soils. The practice entails the removal of brush by the use of mechanical cutter, chopper or other light equipment in order to reduce fuel loading and improve ecological site condition. Brush density has exceeded desired levels based on ecological site potential. It has been determined that the brush is at the medium infestation. Typical unit is 120 acres.

Before Situation:

Area consist of excessive stands of shrub species degrading health and vigor of native herbaceous species promoting noxious and invasive species and degrading wildlife habitat.

After Situation:

Woody species are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and improved wildlife habitat.

Feature Measure: Acres planned

Scenario Unit: Acres

Scenario Typical Size: 120.0

Scenario Total Cost: $10,170.38

Scenario Cost/Unit: $84.75

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	10	$222.90
Mechanical cutter, chopper	943	Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included.	Hours	$90.63	75	$6,797.25
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$18.46	30	$553.80
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	75	$1,984.50
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	10	$453.40
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53

Practice: 314 - Brush Management

Scenario: #5 - Mechanical, Small Shrubs, Heavy Infestation

Scenario Description:

Removal of small woody vegetation of heavy infestations on gentle sloping to moderately deep to deep soils. The practice entails the removal of brush by the use of mechanical cutter, chopper or other light equipment in order to reduce fuel loading and improve ecological site condition. Brush density has exceeded desired levels based on ecological site potential. It has been determined that the brush is at the heavy infestation. Typical unit is 120 acres.

Before Situation:

Area consist of excessive stands of shrub species degrading health and vigor of native herbaceous species promoting noxious and invasive species and degrading wildlife habitat.

After Situation:

Woody species are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and improved wildlife habitat.

Feature Measure: Acres planned

Scenario Unit: Acres

Scenario Typical Size: 120.0

Scenario Total Cost: $11,926.73

Scenario Cost/Unit: $99.39

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	10	$222.90
Mechanical cutter, chopper	943	Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included.	Hours	$90.63	90	$8,156.70
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$18.46	30	$553.80
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	90	$2,381.40
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	10	$453.40
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53

Practice: 314 - Brush Management

Scenario: #6 - Mechanical, Large Shrubs, Light Infestation

Scenario Description:

Removal of large woody vegetation of light infestations on gentle sloping to moderately deep to deep soils. The practice entails the removal of brush by pushing, grubbing, masticating, chaining and then raking or piling in order to reduce fuel loading and improve ecological site condition. Brush density has exceeded desired levels based on ecological site potential. It has been determined that the brush is at the light infestation. Typical unit is 120 acres.

Before Situation:

Area consist of excessive stands of shrub species degrading health and vigor of native herbaceous species promoting noxious and invasive species and degrading wildlife habitat.

After Situation:

Woody species are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and improved wildlife habitat.

Feature Measure: Acres planned

Scenario Unit: Acres

Scenario Typical Size: 120.0

Scenario Total Cost: $28,593.73

Scenario Cost/Unit: $238.28

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 200 HP	928	Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included.	Hours	$190.64	120	$22,876.80
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	10	$222.90
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$18.46	30	$553.80
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	120	$4,036.80
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	10	$453.40
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	1	$450.03

Practice: 314 - Brush Management

Scenario: #7 - Mechanical, Large Shrubs, Medium Infestation

Scenario Description:

Removal of large woody vegetation of medium infestations on gentle sloping to moderately deep to deep soils. The practice entails the removal of brush by pushing, grubbing, masticating, chaining and then raking or piling in order to reduce fuel loading and improve ecological site condition. Brush density has exceeded desired levels based on ecological site potential. It has been determined that the brush is at the medium infestation. Typical unit is 120 acres.

Before Situation:

Area consist of excessive stands of shrub species degrading health and vigor of native herbaceous species promoting noxious and invasive species and degrading wildlife habitat.

After Situation:

Woody species are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and improved wildlife habitat.

Feature Measure: Acres planned

Scenario Unit: Acres

Scenario Typical Size: 120.0

Scenario Total Cost: $46,536.13

Scenario Cost/Unit: $387.80

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 200 HP	928	Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included.	Hours	$190.64	200	$38,128.00
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	10	$222.90
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$18.46	30	$553.80
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	200	$6,728.00
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	10	$453.40
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	1	$450.03

Practice: 314 - Brush Management

Scenario: #8 - Mechanical, Large Shrubs, Heavy Infestation

Scenario Description:

Removal of large woody vegetation of heavy infestations on gentle sloping to moderately deep to deep soils. The practice entails the removal of brush by pushing, grubbing, masticating, chaining then raking or piling in order to reduce fuel loading and improve ecological site condition. Brush density has exceeded desired levels based on ecological site potential. It has been determined that the brush is at the heavy infestation. This scenario can also be used for fields that need different mechanical treatments to treat different species and each species has less than heavy infestation. Typical unit is 120 acres.

Before Situation:

Area consist of excessive stands of shrub species degrading health and vigor of native herbaceous species promoting noxious and invasive species and degrading wildlife habitat.

After Situation:

Woody species are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and improved wildlife habitat.

Feature Measure: Acres planned

Scenario Unit: Acres

Scenario Typical Size: 120.0

Scenario Total Cost: $58,088.28

Scenario Cost/Unit: $484.07

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 200 HP	928	Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included.	Hours	$190.64	250	$47,660.00
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	15	$334.35
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$18.46	30	$553.80
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	250	$8,410.00
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	15	$680.10
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	1	$450.03

Practice: 314 - Brush Management

Scenario: #9 - Mechanical & Chemical, Small Shrubs, Light Infestation

Scenario Description:

Removal of small woody vegetation of light infestations on gentle sloping to moderately deep to deep soils. The practice entails the removal of brush by the use of mechanical cutter, chopper or other light equipment followed by an application of low cost chemicals in low volumes of material in order to reduce fuel loading and improve ecological site condition. Brush density has exceeded desired levels based on ecological site potential. It has been determined that the brush is at the light infestation rate. Typical unit is 120 acres.

Before Situation:

Area consist of excessive stands of shrub species degrading health and vigor of native herbaceous species promoting noxious and invasive species and degrading wildlife habitat.

After Situation:

Woody species are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and improved wildlife habitat.

Feature Measure: Acres planned

Scenario Unit: Acres

Scenario Typical Size: 120.0

Scenario Total Cost: $11,416.43

Scenario Cost/Unit: $95.14

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	10	$222.90
Mechanical cutter, chopper	943	Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included.	Hours	$90.63	60	$5,437.80
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	120	$640.80
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$18.46	30	$553.80
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	60	$1,587.60
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	10	$453.40
Materials						
Herbicide, Picloram	337	Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$18.17	120	$2,180.40
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$1.51	120	$181.20
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53

Practice: 314 - Brush Management

Scenario: #10 - Mechanical & Chemical, Small Shrubs, Medium Infestation

Scenario Description:

Removal of small woody vegetation of medium infestations on gentle sloping to moderately deep to deep soils. The practice entails the removal of brush by the use of mechanical cutter, chopper or other light equipment followed by an application of low cost chemicals in low volumes of material in order to reduce fuel loading and improve ecological site condition. Brush density has exceeded desired levels based on ecological site potential. It has been determined that the brush is at the medium infestation rate. Typical unit is 120 acres.

Before Situation:

Area consist of excessive stands of shrub species degrading health and vigor of native herbaceous species promoting noxious and invasive species and degrading wildlife habitat.

After Situation:

Woody species are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and improved wildlife habitat.

Feature Measure: Acres planned

Scenario Unit: Acres

Scenario Typical Size: 120.0

Scenario Total Cost: $13,172.78

Scenario Cost/Unit: $109.77

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	10	$222.90
Mechanical cutter, chopper	943	Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included.	Hours	$90.63	75	$6,797.25
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	120	$640.80
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$18.46	30	$553.80
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	75	$1,984.50
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	10	$453.40
Materials						
Herbicide, Picloram	337	Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$18.17	120	$2,180.40
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$1.51	120	$181.20
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53

Practice: 314 - Brush Management

Scenario: #11 - Mechanical & Chemical, Small Shrubs, Heavy Infestation

Scenario Description:

Removal of small woody vegetation of heavy infestations on gentle sloping to moderately deep to deep soils. The practice entails the removal of brush by the use of mechanical cutter, chopper or other light equipment t followed by an application of low cost chemicals in low volumes of material in order to reduce fuel loading and improve ecological site condition. Brush density has exceeded desired levels based on ecological site potential. It has been determined that the brush is at the heavy infestation. Typical unit is 120 acres.

Before Situation:

Area consist of excessive stands of shrub species degrading health and vigor of native herbaceous species promoting noxious and invasive species and degrading wildlife habitat.

After Situation:

Woody species are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and improved wildlife habitat.

Feature Measure: Acres planned

Scenario Unit: Acres

Scenario Typical Size: 120.0

Scenario Total Cost: $15,267.28

Scenario Cost/Unit: $127.23

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	15	$334.35
Mechanical cutter, chopper	943	Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included.	Hours	$90.63	90	$8,156.70
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	120	$640.80
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$18.46	30	$553.80
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	90	$2,381.40
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	15	$680.10
Materials						
Herbicide, Picloram	337	Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$18.17	120	$2,180.40
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$1.51	120	$181.20
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53

Practice: 314 - Brush Management

Scenario: #12 - Chemical, Individual Plant Treatment

Scenario Description:

This Practice is for the implementation of brush management on range, pasture or native pasture using Individual Plant Treatment (IPT). The typical method of control is application of herbicides (basal or foliar location) on selected individual plants.

Before Situation:

Brush species exceed desired levels resulting in degraded plant condition, loss of forage production, or degraded wildlife habitat. Densities of brush exceed levels indicated in the ecological site descriptions.

After Situation:

Brush has been treated to a level which results in improved plant condition, forage production, or wildlife habitat. The typical method of control is application of herbicides (basal or foliar location) on selected individual plants.

Feature Measure: Acres treated

Scenario Unit: Acres

Scenario Typical Size: 40.0

Scenario Total Cost: $5,172.87

Scenario Cost/Unit: $129.32

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	2	$44.58
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hours	$66.08	40	$2,643.20
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$19.49	20	$389.80
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$18.46	10	$184.60
Materials						
Herbicide, Tebuthiuron	343	A nonselective broad spectrum herbicide used to control weeds, woody and herbaceous plants, and sugar cane. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$44.63	40	$1,785.20
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$1.51	40	$60.40
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	1	$65.09

Practice: 314 - Brush Management

Scenario: #13 - Chemical or Mechanical, hand tools, light

Scenario Description:

Apply brush management on rangeland, grazed forest, or pasture thru the use of broadcast application (ground or aerial) of material using low cost chemical(s) to reduce or remove undesirable woody species (brush) in uplands and other areas not in or directly adjacent to streams, ponds, or wetlands OR Using hand tools, such as axes, shovels, hoes, nippers, brush pullers, and including chainsaws to remove or cut off woody plants at or below the root collar. Typical area is moderate rolling to gentle sloping that have stands of woody species that are in the early phases of invasion.

Before Situation:

Plant, animal, or wildlife resource concerns associated with uplands and other areas not in or adjacent to stream, ponds, or wetland on grazed range, grazed forest, or pasture which are adversely affected by brush.

After Situation:

A unit of pasture, grazed range, or grazed forest where reduction or removal of undesirable woody deciduous species have been accomplished to address plant, animal, and wildlife resource concerns.

Feature Measure: Acres planned

Scenario Unit: Acres

Scenario Typical Size: 160.0

Scenario Total Cost: $10,126.17

Scenario Cost/Unit: $63.29

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	2	$44.58
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	160	$854.40
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	2	$90.68
Materials						
Herbicide, Triazine	1321	Broad spectrum herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$55.63	160	$8,900.80
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 314 - Brush Management

Scenario: #15 - Low Cost Chemical, Aerial Applied

Scenario Description:

Apply brush management on 500 acres of rangeland, grazed forest, or pasture thru the use of broadcast aerial application of material with low cost chemical(s) to reduce or remove undesirable woody species (such as mesquite and or shinnery oak brush) in uplands and other areas not in or directly adjacent to streams, ponds, or wetlands.

Before Situation:

Plant, animal, or wildlife resource concerns associated with uplands and other areas not in or adjacent to stream, ponds, or wetland on grazed range, grazed forest, or pasture which are adversely affected by brush.

After Situation:

A 500 acre unit of pasture, grazed range, or grazed forest where reduction or removal of undesirable woody species (brush) have been accomplished by broadcast or spot treatment chemical application to address plant, animal, and wildlife resource concerns.

Feature Measure: Acres planned

Scenario Unit: Acres

Scenario Typical Size: 500.0

Scenario Total Cost: $25,993.47

Scenario Cost/Unit: $51.99

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	2	$44.58
Chemical, aerial application, fixed wing	947	Chemical application performed by fixed wing aircraft. Includes equipment, power unit and labor costs.	Acres	$9.73	500	$4,865.00
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$18.46	125	$2,307.50
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	2	$90.68
Materials						
Herbicide, Picloram	337	Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$18.17	250	$4,542.50
Herbicide, Triazine	1321	Broad spectrum herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$55.63	250	$13,907.50
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 314 - Brush Management

Scenario: #16 - Chemical, Aerial Applied (Resprouting Species) or Mechanical, hand tools, medium

Scenario Description:

Apply brush management on rangeland, grazed forest, or pasture thru the use of broadcast aerial application of chemical(s) to reduce or remove undesirable woody species (resprouting species) in uplands and other areas OR Using hand tools, such as axes, shovels, hoes, nippers, brush pullers, and including chainsaws to remove or cut off woody plants at or below the root collar. Typical area is moderate rolling to gentle sloping that have stands of woody species that are in the moderate phases of invasion

Before Situation:

Plant, animal, or wildlife resource concerns associated with uplands and other areas on grazed range, grazed forest, or pasture which are adversely affected by brush or trees.

After Situation:

Pasture, grazed range, or grazed forest where reduction or removal of undesirable woody species have been accomplished to address plant, animal, and wildlife resource concerns.

Feature Measure: Acres planned

Scenario Unit: Acres

Scenario Typical Size: 30.0

Scenario Total Cost: $2,349.77

Scenario Cost/Unit: $78.33

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	5	$111.45
Chemical, aerial application, fixed wing	947	Chemical application performed by fixed wing aircraft. Includes equipment, power unit and labor costs.	Acres	$9.73	30	$291.90
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	8	$362.72
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$9.21	30	$276.30
Herbicide, Imazapyr	336	Pre and post-emergent, non-selective herbicide for control of undesirable vegetation in non-crop areas. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$42.07	30	$1,262.10
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$1.51	30	$45.30

Practice: 314 - Brush Management

Scenario: #17 - Mechanical & Chemical, Large Shrub

Scenario Description:

The practice entails the removal of large woody vegetation (brush) by the use of mechanical cutter, chopper or other light equipment t followed by an application of low cost chemicals in low volumes of material in order to reduce fuel loading and improve ecological site condition. Brush density has exceeded desired levels based on ecological site potential. Typical unit is 120 acres. This scenario will address the resource concerns of Inadequate Structure and Composition and/or Excessive Plant Pest Pressure and/or Inadequate Feed and Forage.

Before Situation:

Area consist of excessive stands of large shrub species degrading health and vigor of native herbaceous species promoting noxious and invasive species and degrading wildlife habitat

After Situation:

Woody species are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and improved wildlife habitat.

Feature Measure: Acres planned

Scenario Unit: Acres

Scenario Typical Size: 120.0

Scenario Total Cost: $29,061.93

Scenario Cost/Unit: $242.18

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	11	$245.19
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hours	$46.50	245	$11,392.50
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	120	$640.80
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$21.30	245	$5,218.50
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$18.46	30	$553.80
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	245	$6,482.70
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	8	$362.72
Materials						
Herbicide, Triclopyor	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acres	$27.92	120	$3,350.40
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$1.51	120	$181.20
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	4	$634.12

Practice: 314 - Brush Management

Scenario: #18 - PJ Mechanical Removal - Low Density

Scenario Description:

Removal of pinyon/juniper trees in areas with low density encroachment of less than 100 trees per acre. The practice entails the removal of trees by mechanical means, either chainsaw or heavy equipment or a combination as appropriate in order to reduce fuel loading and improve ecological site condition. Tree density has exceeded desired levels based on ecological site potential and data collected as per state specifications to determine actual density. Typical unit is 500 acres in fairly remote areas.

Before Situation:

Area consists of excessive stands of pinyon juniper degrading health and vigor of native herbaceous species promoting noxious and invasive species and degrading wildlife habitat, especially for sage grouse areas.

After Situation:

Pinyon/Juniper trees are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and improved wildlife habitat.

Feature Measure: Acres planned

Scenario Unit: Acres

Scenario Typical Size: 500.0

Scenario Total Cost: $73,632.21

Scenario Cost/Unit: $147.26

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Mechanical cutter, chopper	943	Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included.	Hours	$90.63	550	$49,846.50
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$18.46	125	$2,307.50
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	550	$13,304.50
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	300	$7,938.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 314 - Brush Management

Scenario: #19 - PJ Mechanical Removal - Moderate Density

Scenario Description:

Removal of pinyon/juniper trees in areas with moderate density encroachment between 101 - 250 trees per acre. The practice entails the removal of trees by mechanical means, either chainsaw or heavy equipment or a combination as appropriate in order to reduce fuel loading and improve ecological site condition. Tree density has exceeded desired levels based on ecological site potential and data collected as per state specifications to determine actual density. Typical unit is 350 acres in fairly remote areas.

Before Situation:

Area consists of excessive stands of pinyon juniper degrading health and vigor of native herbaceous species promoting noxious and invasive species and degrading wildlife habitat, especially for sage grouse areas.

After Situation:

Pinyon/Juniper trees are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and improved wildlife habitat.

Feature Measure: Acres planned

Scenario Unit: Acres

Scenario Typical Size: 350.0

Scenario Total Cost: $104,983.21

Scenario Cost/Unit: $299.95

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Mechanical cutter, chopper	943	Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included.	Hours	$90.63	800	$72,504.00
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$18.46	125	$2,307.50
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	800	$19,352.00
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	400	$10,584.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 314 - Brush Management

Scenario: #21 - Juniper Chaining, one pass

Scenario Description:

Site preparation of a field with 2 dozers and an anchor chain to uproot pinyon and juniper trees to achieve a conservation objective. Typical scenario is approximately 500 acres of trees to be cleared. The resource concern is determined by the conservation objective met with the final practice applied to the field, typically sage grouse habitat and/or forage improvement.

Before Situation:

Wooded juniper area of approximately 500 acres, with variable density tree canopy.

After Situation:

Crew uses 2 dozers and an anchor chain to clear trees and prepare field for conservation objective. Associated practices, like plantings, woody debris removal, other structures, or irrigation/drainage water management practices, would be contracted separately as needed.

Feature Measure: Acres planned

Scenario Unit: Acres

Scenario Typical Size: 500.0

Scenario Total Cost: $43,606.71

Scenario Cost/Unit: $87.21

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 200 HP	928	Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included.	Hours	$190.64	180	$34,315.20
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$18.46	33	$609.18
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	90	$2,177.10
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	180	$6,055.20
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	1	$450.03

Practice: 314 - Brush Management

Scenario: #22 - Juniper Chaining, two pass

Scenario Description:

Site preparation of a field with 2 dozers and an anchor chain to uproot pinyon and juniper trees to achieve a conservation objective. Typical scenario is approximately 500 acres of trees to be cleared. The resource concern is determined by the conservation objective met with the final practice applied to the field, typically sage grouse habitat and/or forage improvement.

Before Situation:

Wooded juniper area of approximately 500 acres, with variable density tree canopy.

After Situation:

Crew uses 2 dozers and an anchor chain to clear trees and prepare field for conservation objective. Associated practices, like plantings, woody debris removal, other structures, or irrigation/drainage water management practices, would be contracted separately as needed.

Feature Measure: Acres planned

Scenario Unit: Acres

Scenario Typical Size: 500.0

Scenario Total Cost: $82,347.38

Scenario Cost/Unit: $164.69

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 200 HP	928	Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included.	Hours	$190.64	320	$61,004.80
Dozer, 200 HP	928	Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included.	Hours	$190.64	33	$6,291.12
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	140	$3,386.60
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	320	$10,764.80
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	2	$900.06

Practice: 314 - Brush Management

Scenario: #27 - Riparian Area or Sensitive Area

Scenario Description:

The practice entails the removal or thinning of brush in riparian or other sensitive areas by the use of mechanical cutter, chopper or chainsaw followed by herbicide application through stump painting and piling the resulting woody debris in order to improve ecological site or riparian condition. The brush species and/or level of infestation impairs plant community health, wildlife habitat, streambank functions and/or agricultural operations. Brush is at heavy infestation levels.

Before Situation:

Riparian or sensitive area consists of excessive stands of brush degrading health and vigor of native species and degrading wildlife habitat. The brush cannot be cleared with heavy equipment and widespread chemical use due to the sensitive nature of the area.

After Situation:

Woody species are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and improved wildlife habitat.

Feature Measure: Acres planned

Scenario Unit: Acres

Scenario Typical Size: 10.0

Scenario Total Cost: $11,030.38

Scenario Cost/Unit: $1,103.04

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Track Loader, 95HP	935	Equipment and power unit costs. Labor not included.	Hours	$83.63	20	$1,672.60
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.59	120	$790.80
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	80	$1,783.20
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hours	$66.08	10	$660.80
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$19.49	40	$779.60
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	120	$2,902.80
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	40	$1,813.60
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$9.21	2	$18.42
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	1	$450.03

Practice: 315 - Herbaceous Weed Treatment

Scenario: #1 - Mechanical, Hand

Scenario Description:

Using hand tools, such as axes, shovels, hoes, nippers, to remove or cut off herbaceous plants at of below the root collar. Typical area is moderate rolling to gentle sloping, moderately deep to deep soils that have herbaceous weed species that are in the early phases of invasions. Typical unit is 20 acres.

Before Situation:

Area is in the very early phases of herbaceous weed encroachment that degrades habitat for desired wildlife species. Future degradation of key forage species and ecological site condition promoting noxious and invasive species and increased soil erosion if woody species are allowed to expand.

After Situation:

Herbaceous weeds are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition continues to progressing in an upward trend, hydrology and plant health and vigor are sustained.

Feature Measure: Acres treated

Scenario Unit: Acres

Scenario Typical Size: 10.0

Scenario Total Cost: $586.20

Scenario Cost/Unit: $58.62

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	1	$22.29
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$19.49	5	$97.45
Pruning tools, hand tools	1318	Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included.	Hours	$2.13	16	$34.08
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	16	$387.04
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	1	$45.34

Practice: 315 - Herbaceous Weed Treatment

Scenario: #2 - Mechanical

Scenario Description:

Removal of herbaceous weeds of light infestations on gentle sloping to moderately deep to deep soils. The practice entails the removal of herbaceous weeds by the use of mower, brush hog, disc or other light equipment in order to reduce fuel loading and improve ecological site condition. Weed has exceeded desired levels based on ecological site potential. Typical unit is 40 acres.

Before Situation:

Area consist of excessive stands of herbaceous weeds degrading health and vigor of native herbaceous species promoting noxious and invasive species and degrading wildlife habitat.

After Situation:

Herbaceous weeds are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and improved wildlife habitat.

Feature Measure: Acres treated

Scenario Unit: Acres

Scenario Typical Size: 40.0

Scenario Total Cost: $822.23

Scenario Cost/Unit: $20.56

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	2	$44.58
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hours	$46.50	6	$279.00
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	6	$158.76
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	4	$181.36
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53

Practice: 315 - Herbaceous Weed Treatment

Scenario: #3 - Chemical, Spot

Scenario Description:

Land unit on which weed control would be beneficial in order to set back the plant community succession, improve the ecological condition, and improve forage conditions for domestic livestock or wildlife. The practice entails the eradication of vegetation by use of weed treatment, either initial or retreatment using hand-carried equipment (such as a backpack and hand-sprayer) to apply chemicals, in order to eliminate noxious weeds, promote forage productivity, and improve ecological condition.

Before Situation:

Area consist of excessive stands of herbaceous weeds degrading health and vigor of native herbaceous species promoting noxious and invasive species and degrading wildlife habitat.

After Situation:

Herbaceous weeds are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and improved wildlife habitat.

Feature Measure: Acres treated

Scenario Unit: Acres

Scenario Typical Size: 20.0

Scenario Total Cost: $728.76

Scenario Cost/Unit: $36.44

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	4	$89.16
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$19.49	10	$194.90
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	10	$241.90
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	4	$181.36
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$9.21	2	$18.42
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$1.51	2	$3.02

Practice: 315 - Herbaceous Weed Treatment

Scenario: #4 - Chemical, Ground

Scenario Description:

Land unit on which weed control would be beneficial in order to set back the plant community succession, improve the ecological condition, and improve forage conditions for domestic livestock or wildlife. The practice entails the eradication of vegetation by use of weed treatment using ground equipment to apply chemicals, in order to eliminate noxious weeds, promote forage productivity, and improve ecological condition.

Before Situation:

Area consist of excessive stands of herbaceous weeds degrading health and vigor of native herbaceous species promoting noxious and invasive species and degrading wildlife habitat.

After Situation:

Herbaceous weeds are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and improved wildlife habitat.

Feature Measure: Acres treated

Scenario Unit: Acres

Scenario Typical Size: 20.0

Scenario Total Cost: $795.41

Scenario Cost/Unit: $39.77

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	4	$89.16
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	20	$106.80
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	4	$96.76
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	4	$181.36
Materials						
Herbicide, 2,4-D	330	Broadleaf herbicide labeled for cropland and pasture. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$6.63	20	$132.60
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$1.51	20	$30.20
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53

Practice: 315 - Herbaceous Weed Treatment

Scenario: #5 - Chemical, Aerial

Scenario Description:

Land unit on which weed control would be beneficial in order to set back the plant community succession, improve the ecological condition, and improve forage conditions for domestic livestock or wildlife. The practice entails the eradication of vegetation by use of weed treatment using airplane or helicopter to apply chemicals, in order to eliminate noxious weeds, promote forage productivity, and improve ecological condition.

Before Situation:

Area consist of excessive stands of herbaceous weeds degrading health and vigor of native herbaceous species promoting noxious and invasive species and degrading wildlife habitat.

After Situation:

Herbaceous weeds are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and improved wildlife habitat.

Feature Measure: Acres treated

Scenario Unit: Acres

Scenario Typical Size: 20.0

Scenario Total Cost: $635.52

Scenario Cost/Unit: $31.78

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, aerial application, fixed wing	947	Chemical application performed by fixed wing aircraft. Includes equipment, power unit and labor costs.	Acres	$9.73	20	$194.60
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	4	$96.76
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	4	$181.36
Materials						
Herbicide, 2,4-D	330	Broadleaf herbicide labeled for cropland and pasture. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$6.63	20	$132.60
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$1.51	20	$30.20

Practice: 315 - Herbaceous Weed Treatment

Scenario: #6 - hand and chemical

Scenario Description:

Using hand tools, such as axes, shovels, hoes, nippers, to remove or cut off herbaceous plants at or below the root collar. Herbicide is applied to control re-growth of target weeds. Typical area is moderate rolling to gentle sloping, moderately deep to deep soils that have herbaceous weed species that are in the early phases of invasions. Typical unit is 10 acres.

Before Situation:

Area consist of excessive stands of herbaceous weeds degrading health and vigor of native herbaceous species promoting noxious and invasive species and degrading wildlife habitat.

After Situation:

Herbaceous weeds are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and improved wildlife habitat.

Feature Measure: acres planned

Scenario Unit: Acres

Scenario Typical Size: 10.0

Scenario Total Cost: $798.12

Scenario Cost/Unit: $79.81

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	1	$22.29
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hours	$66.08	1	$66.08
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$19.49	5	$97.45
Pruning tools, hand tools	1318	Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included.	Hours	$2.13	10	$21.30
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	10	$241.90
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	4	$181.36
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$9.21	1	$9.21
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53

Practice: 315 - Herbaceous Weed Treatment

Scenario: #7 - mechanical and chemical

Scenario Description:

Removal of herbaceous weeds of light infestations on gentle sloping to moderately deep to deep soils. The practice entails the removal of herbaceous weeds by the use of mower, brush hog, disc or other light equipment in order to reduce fuel loading and improve ecological site condition, then applying herbicide to control re-growth of target weeds. Weed has exceeded desired levels based on ecological site potential. Typical unit is 40 acres.

Before Situation:

Area consist of excessive stands of herbaceous weeds degrading health and vigor of native herbaceous species promoting noxious and invasive species and degrading wildlife habitat.

After Situation:

Herbaceous weeds are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and improved wildlife habitat.

Feature Measure: acres planned

Scenario Unit: Acres

Scenario Typical Size: 10.0

Scenario Total Cost: $1,036.28

Scenario Cost/Unit: $103.63

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	1	$22.29
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hours	$46.50	2	$93.00
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	10	$53.40
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$19.49	2	$38.98
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	2	$52.92
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	4	$181.36
Materials						
Herbicide, Imazapyr	336	Pre and post-emergent, non-selective herbicide for control of undesirable vegetation in non-crop areas. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$42.07	10	$420.70
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$1.51	10	$15.10
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53

Practice: 315 - Herbaceous Weed Treatment

Scenario: #8 - split-method and event series

Scenario Description:

The practice entails the control of herbaceous vegetation by treating it up to three times during the multi-year treatment period in order to improve ecological site condition. The herbs can be treated with the same method or by a combination of methods. Vegetation needs to be treated at least twice in order to fully control it. Generally,herbicide volumes are reduced as the last treatment will kill resprouting stems or those which survived the first treatment or newly sprouted seedlings. Density has exceeded desired levels based on ecological site potential.

Before Situation:

Area consist of excessive stands of herbaceous weeds degrading health and vigor of native herbaceous species promoting noxious and invasive species and degrading wildlife habitat.

After Situation:

Herbaceous weeds are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and improved wildlife habitat.

Feature Measure: acres planned

Scenario Unit: Acres

Scenario Typical Size: 25.0

Scenario Total Cost: $1,942.19

Scenario Cost/Unit: $77.69

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	4	$89.16
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hours	$46.50	4	$186.00
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	25	$133.50
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	8	$193.52
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	4	$105.84
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	4	$181.36
Materials						
Herbicide, Triclopyor	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acres	$27.92	25	$698.00
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$1.51	25	$37.75
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	2	$317.06

Practice: 316 - Animal Mortality Facility

Scenario: #1 - Incineration, < 50 CF Chamber

Scenario Description:

This scenario consists of installing a manufactured Type IV incinerator designed to handle 350 lbs of average daily mortality for the species and size of the operation. System shall use high temperature (>1,300 degrees F) incineration with a secondary combustion or afterburner chamber prior to flue discharge. After determining average daily mortality in lbs, select smallest incinerator that meets capacity. Payment made per unit of actual chamber size obtained from manufacturers' product literature. This option is not typically least-cost. In most states a roofed static compost pile with concrete floor and bins would be considered least cost. Therefore consider reducing payment rate as per State Conservationist discretion. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed, however, in non-attainment areas, certain states may require a higher level of processing such as gasification or other approved methods. Potential Associated Practices: Heavy Use Area Protection (561), Fence (382), Critical Area Planting (342), Access Road (560), Waste Storage Facility (313), Nutrient Management (590), Roofs and Covers (367), Critical Area Planting (342).

Before Situation:

Animal mortality is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from incomplete composting, incineration, or interaction with predators. No plan was formulated for both normal and catastrophic mortality events.

After Situation:

Animal mortality is being done in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, complete incineration, and protection from predators to minimize pathogen survival or spreading. An overall plan covers normal and catastrophic mortality events. Selected method for carcass treatment and disposal meet or are permitted by federal, state, and local laws, rules, regulation. Typical incinerator installed to handle 150 lbs per day average mortality for a small poultry operation and has an incinerator chamber volume of 44 cubic feet. Included is a concrete slab to set the incinerator on and a fuel tank. Ash materials to be stored in suitable containers until land disposal as per the nutrient management plan or landfilled.

Feature Measure: Incinerator Chamber Volume

Scenario Unit: Cubic Feet

Scenario Typical Size: 44.0

Scenario Total Cost: $11,578.46

Scenario Cost/Unit: $263.15

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$372.36	4	$1,489.44
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	8	$16.64
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$100.83	1	$100.83
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	1	$24.19
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	1	$26.46
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	4	$120.28
Fuel Tank, Anchored	1033	Fuel tank for operating incinerators and/or gasifiers. Materials only.	Gallons	$4.16	285	$1,185.60
Incinerator, 200 lbs/day	1624	Poultry and livestock incinerator with an approximate chamber capacity of 200 pounds per day. Includes equipment and after burner only.	Each	$8,379.31	1	$8,379.31
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 316 - Animal Mortality Facility

Scenario: #2 - Incineration 50-100CF chamber

Scenario Description:

This scenario consists of installing a manufactured Type IV incinerator designed to handle 350 to 850 lbs of average daily mortality for the species and size of the operation. Typically very large poultry or medium sized swine operations. System shall use high temperature (>1,300 degrees F) incineration with a secondary combustion or afterburner chamber prior to flue discharge. After determining average daily mortality in lbs, select smallest incinerator that meets capacity. Payment made per unit of actual chamber size obtained from manufacturers' product literature. This option is not typically least-cost. In most states a roofed static pile with concrete floor and bins would be considered least cost. Therefore consider reducing payment rate as per State Conservationist discretion. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors are reduced, however, in non-attainment areas, certain states may require a higher level of processing such as gasification or other approved methods. Potential Associated Practices: Heavy Use Area Protection (561), Fence (382), Critical Area Planting (342), Access Road (560), Waste Storage Facility (313), Nutrient Management (590), Roofs and Covers (367), Critical Area Planting (342).

Before Situation:

Animal mortality is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from incomplete composting, incineration, or interaction with predators. No plan was formulated for both normal and catastrophic mortality events.

After Situation:

Animal mortality is being done in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, complete incineration, and protection from predators to minimize pathogen survival or spreading. In non-attainment areas, certain states may require a higher level of processing such as gasification or different methods. An overall plan covers normal and catastrophic mortality events. Selected method for carcass treatment and disposal meet or are permitted by federal, state, and local laws, rules, regulation. Typical incinerator installed to handle 700 lbs per day average mortality for a medium poultry or swine operation and has an incinerator chamber volume of 55.8 cubic feet. Included is a concrete slab to set the incinerator on and a diesel fuel tank. Ash materials to be stored in suitable containers until land disposal as per the nutrient managment plan or landfilled.

Feature Measure: Incinerator Chamber Volume

Scenario Unit: Cubic Feet

Scenario Typical Size: 55.8

Scenario Total Cost: $12,296.68

Scenario Cost/Unit: $220.37

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$372.36	4	$1,489.44
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	8	$16.64
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$100.83	1	$100.83
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	1	$24.19
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	1	$26.46
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	4	$120.28
Fuel Tank, Anchored	1033	Fuel tank for operating incinerators and/or gasifiers. Materials only.	Gallons	$4.16	285	$1,185.60
Incinerator, 400 lbs/day	1625	Poultry and livestock incinerator with an approximate chamber capacity of 400 pounds per day. Includes equipment and after burner only.	Each	$9,097.53	1	$9,097.53
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 316 - Animal Mortality Facility

Scenario: #3 - Incineration >100 CF Chamber

Scenario Description:

This scenario consists of installing a manufactured Type IV incinerator designed to handle a single 1,200 to 1,500 mortality. Typically a single dairy cow or multiple heifers or swine. System shall use high temperature (>1,300 degrees F) incineration with a secondary combustion or afterburner chamber prior to flue discharge. Select smallest incinerator that has a bin capacity to handle largest individual mortality. Payment made per unit of actual chamber size obtained from manufacturers' product literature. This option uses a very small footprint, however, it costs 15-20 gallons of diesel fuel per fill. The usage needs to be significant. At 500 cows with replacements, this option would offset a 4,000 SF concrete pad with another 8,000 to 12,000 SF of grassed area. This option for small dairy operations would not typically be least-cost. In most states either a roofed or unroofed static pile with concrete floor and walls would be considered least cost. Unless regulations require this or severe site limitations exist, consider reducing payment rate as per State Conservationist discretion. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed, however, in non-attainment areas, certain states may require a higher level of processing such as gasification or other approved methods. Potential Associated Practices: Heavy Use Area Protection (561), Fence (382), Critical Area Planting (342), Access Road (560), Waste Storage Facility (313), Nutrient Management (590), Roofs and Covers (367), Critical Area Planting (342).

Before Situation:

Animal mortality is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from incomplete composting, incineration, or interaction with predators. No plan was formulated for both normal and catastrophic mortality events.

After Situation:

Animal mortality is being done in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, complete incineration, and protection from predators to minimize pathogen survival or spreading. An overall plan covers normal and catastrophic mortality events. In non-attainment areas, certain states may require a higher level of processing such as gasification or other approved method. Selected method for carcass treatment and disposal meet or are permitted by federal, state, and local laws, rules, regulations. Typical incinerator installed to handle a whole 1350 lb dairy cow on a 1,000 cow operation and has an incinerator chamber volume of 119.6 cubic feet. Included is a concrete slab to set the incinerator on and a fuel tank. Ash materials to be stored in suitable containers, a waste storage pit until land disposal as per the nutrient management plan or landfilled. Proper incineration will require between 15 and 25 gallons of diesel fuel per usage.

Feature Measure: Incineration Chamber Volume

Scenario Unit: Cubic Feet

Scenario Typical Size: 119.6

Scenario Total Cost: $13,412.33

Scenario Cost/Unit: $112.14

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$372.36	4	$1,489.44
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	8	$16.64
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$100.83	1	$100.83
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	1	$24.19
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	1	$26.46
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	4	$120.28
Fuel Tank, Anchored	1033	Fuel tank for operating incinerators and/or gasifiers. Materials only.	Gallons	$4.16	285	$1,185.60
Incinerator, 600 lbs/day	1626	Poultry and livestock incinerator with an approximate chamber capacity of 600 pounds per day. Includes equipment and after burner only.	Each	$10,213.18	1	$10,213.18
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 316 - Animal Mortality Facility

Scenario: #4 - Small Animal Type

Scenario Description:

This scenario will address animal mortalities for small animal types (less than 10 pound average weight -i.e. broilers and birth to weaning swine). It was developed for various types of animal mortality facilities as listed below (which is not an exhaustive list): - Static Bin: Consisting of a group of small bins (concrete or wood walls) on a concrete pad to compost mortality in static pile(s) that have sufficient bulking material to allow natural aeration. Piles are turned to go through a second heat cycle prior to final land application. - Invessel Rotary Drum. A commercially manufactured horizontal rotary drum to compost animal mortalities mixed with a carbon material (i.e. sawdust or wood chips). A secondary composting storage area is required to finish materials. - Invessel Grinding Batch. A commercially manufactured grinding batch composter with a minimum capacity of 1,000 lbs per batch. A secondary composting storage area is required to finish materials. - Forced Air Composting Bins: Consisting of a group of small bins with an aeration and leachate collection system. (This scenario does not address incinerators.) The least cost scenario is based on a static bin system with wood walls. The roofed portion of the facility is addressed with Roofs and Covers (367). Approach apron is addressed with Heavy Use Area Protection (561). Size of facility is based on daily mortality and sizing procedures accepted in particular state. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Organic sites will require more frequent replacement of lumber (if used). Potential Associated Practices: Roofs and Cover (367), Heavy Use Area Protection (561), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Structure for Water Control (587), Roof Runoff Structure (558), Diversion (362), Subsurface Drain (606), and Underground Outlet (620).

Before Situation:

Animal mortality is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from incomplete composting, incineration, or interaction with predators. No plan was formulated for both normal and catastrophic mortality events.

After Situation:

Animal mortality is being done in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors and protection from predators to minimize pathogen survival or spreading. An overall plan covers normal and catastrophic mortality events. Selected method for carcass treatment and disposal meet or are permitted by federal, state, and local laws, rules, regulation. The typical mortality facility is based on a wooden wall static bin composting facility with the primary bins on one side and secondary bins along the backside. A typical livestock operation consists of a 88,000 broiler operation with 6 flocks per year. Average bird weight is 4 pounds with an average mortality rate of 5%. The average daily mortality is 289 lb/day which requires a minimum primary bin volume of 646 ft3. The secondary bin volume is the same as the primary bin. The facility will be installed on a 12' X 24' concrete pad with 6 bins (3 primary and 3 secondary bins) with a total bin capacity of 1,440 cubic feet. Bin dimensions are 5' Height x 8' Width x 6' Length. Bin wall consists of a 1' concrete curb and 4' of treated lumber. Site preparation includes topsoil removal, installing 4" of gravel, setting posts , installing concrete slab (5"), installing wooden walls and retaining planks. Piles turned to go through a second heat cycle prior to final land application.

Feature Measure: Average daily mortality pounds per

Scenario Unit: Pounds per Day

Scenario Typical Size: 289.0

Scenario Total Cost: $8,972.72

Scenario Cost/Unit: $31.05

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formless, non reinforced	36	Non reinforced concrete cast-in-placed without forms by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$184.90	2	$369.80
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$372.36	4.5	$1,675.62
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$494.40	1.5	$741.60
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	5.5	$11.44
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.72	4	$202.88
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hours	$11.75	4	$47.00
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	80	$2,729.60
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	4	$105.84
Materials						

Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	4	$120.28
Dimension Lumber, Treated	1044	Treated dimension lumber with nominal thickness equal or less than 2". Includes lumber and fasteners	Board Feet	$1.14	1440	$1,641.60
Lumber, planks, posts and timbers, treated	1609	Treated dimension lumber with nominal thickness greater than 2". Includes lumber and fasteners. Does not include labor.	Board Feet	$1.97	360	$709.20
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	1	$65.09
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	2	$317.06
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 316 - Animal Mortality Facility

Scenario: #5 - Medium Animal Type

Scenario Description:

This scenario will address animal mortalities for medium animal types (which generally range in size from 10 to 50 pounds average weight -i.e. turkeys and nursery pigs). It was developed for various types of animal mortality facilities as listed below (which is not an exhaustive list): - Static Bin:Consisting of a group of small bins (concrete or wood walls) on a concrete pad to compost mortality in static pile(s) that have sufficient bulking material to allow natural aeration. Piles are turned to go through a second heat cycle prior to final land application. - Invessel Rotary Drum. A commercially manufactured horizontal rotary drum to compost animal mortalities mixed with a carbon material (i.e. sawdust or wood chips). A secondary composting storage area is required to finish materials. - Invessel Grinding Batch. A commercially manufactured grinding batch composter with a minimum capacity of 1,000 lbs per batch. A secondary composting storage area is required to finish materials. - Forced Air Composting Bins: Consisting of a group of small bins with an aeration and leachate collection system. (This scenario does not address incinerators.) The least cost scenario is based on a static bin system with wood walls. The roofed portion of the facility is addressed with Roofs and Covers (367). Approach apron is addressed with Heavy Use Area Protection (561). Size of facility is based on daily mortality and sizing procedures accepted in particular state. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Organic sites will require more frequent replacement of lumber (if used). Potential Associated Practices: Roofs and Cover (367), Heavy Use Area Protection (561), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Structure for Water Control (587), Roof Runoff Structure (558), Diversion (362), Subsurface Drain (606), and Underground Outlet (620).

Before Situation:

Animal mortality is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from incomplete composting, incineration, or interaction with predators. No plan was formulated for both normal and catastrophic mortality events.

After Situation:

Animal mortality is being done in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, complete composting, and protection from predators to minimize pathogen survival or spreading. An overall plan covers normal and catastrophic mortality events. Selected method for carcass treatment and disposal meet or are permitted by federal, state, and local laws, rules, regulation. The typical mortality facility is based on a wooden wall static bin composting facility with the primary bins on one side and secondary bins along the backside. A typical livestock operation consists of a 28,000 hen turkey operation with 3 flocks per year. Average bird weight is 20 pounds with an average mortality rate of 7%. The average daily mortality is 322 lb/day which requires a minimum primary bin volume of 1,611 ft3. The secondary bin volume is the same as the primary bin. The facility will be installed on a 20' X 36' concrete pad with 6 bins (3 primary and 3 secondary bins) for a total bin capacity of 3,600 cubic feet. Bin dimensions are 5' Height x 12' Width x 10' Length. Bin wall consists of a 1' concrete curb and 4' of treated lumber. Site preparation includes topsoil removal, installing 4" of gravel, setting posts , installing concrete slab (5"), installing wooden walls and retaining planks. Piles turned to go through a second heat cycle prior to final land application.

Feature Measure: Average daily mortality pounds per

Scenario Unit: Pounds per Day

Scenario Typical Size: 322.0

Scenario Total Cost: $15,507.44

Scenario Cost/Unit: $48.16

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formless, non reinforced	36	Non reinforced concrete cast-in-placed without forms by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$184.90	3	$554.70
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$372.36	11.5	$4,282.14
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$494.40	2.5	$1,236.00
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	13.5	$28.08
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.72	7	$355.04
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hours	$11.75	7	$82.25
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	120	$4,094.40
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	7	$185.22
Materials						

Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	9	$270.63
Dimension Lumber, Treated	1044	Treated dimension lumber with nominal thickness equal or less than 2". Includes lumber and fasteners	Board Feet	$1.14	2256	$2,571.84
Lumber, planks, posts and timbers, treated	1609	Treated dimension lumber with nominal thickness greater than 2". Includes lumber and fasteners. Does not include labor.	Board Feet	$1.97	624	$1,229.28
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	1	$65.09
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	2	$317.06
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 316 - Animal Mortality Facility

Scenario: #6 - Large Animal Type

Scenario Description:

This scenario will address animal mortalities for large animal types (which generally range in size from 50 to 300 average weight -i.e. grower/finishing pigs sheep and goats). It was developed for various types of animal mortality facilities as listed below (which is not an exhaustive list): - Static Bin:Consisting of a group of small bins (concrete or wood walls) on a concrete pad to compost mortality in static pile(s) that have sufficient bulking material to allow natural aeration. Piles are turned to go through a second heat cycle prior to final land application. - Invessel Rotary Drum. A commercially manufactured horizontal rotary drum to compost animal mortalities mixed with a carbon material (i.e. sawdust or wood chips). A secondary composting storage area is required to finish materials. - Invessel Grinding Batch. A commercially manufactured grinding batch composter with a minimum capacity of 1,000 lbs per batch. A secondary composting storage area is required to finish materials. - Forced Air Composting Bins: Consisting of a group of small bins with an aeration and leachate collection system. (This scenario does not address incinerators.) The least cost scenario is based on a static bin system with wood walls. The roofed portion of the facility is addressed with Roofs and Covers (367). Approach apron is addressed with Heavy Use Area Protection (561). Size of facility is based on daily mortality and sizing procedures accepted in particular state. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Organic sites will require more frequent replacement of lumber (if used). Potential Associated Practices: Roofs and Cover (367), Heavy Use Area Protection (561), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Structure for Water Control (587), Roof Runoff Structure (558), Diversion (362), Subsurface Drain (606), and Underground Outlet (620).

Before Situation:

Animal mortality is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from incomplete composting, incineration, or interaction with predators. No plan was formulated for both normal and catastrophic mortality events.

After Situation:

Animal mortality is being done in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, complete composting, and protection from predators to minimize pathogen survival or spreading. An overall plan covers normal and catastrophic mortality events. Selected method for carcass treatment and disposal meet or are permitted by federal, state, and local laws, rules, regulation. The typical mortality facility is based on a wooden wall static bin composting facility with the primary bins on one side and secondary bins along the backside. A typical livestock operation consists of a 6,400 finishing pigs with 2.5 litters per year (all in all out system). Average pig weight is 160 pounds with an average mortality rate of 3%. The average daily mortality is 210 lb/day which requires a minimum primary bin volume of 3,320 ft3. The secondary bin volume is the same as the primary bin. The facility will be installed on a 20' X 72' concrete pad with 12 bins (6 primary and 6 secondary bins) for a total bin capacity of 7,200 cubic feet. Bin dimensions are 5' Height x 12' Width x 10' Length. Bin wall consists of a 1' concrete curb and 4' of treated lumber. Site preparation includes topsoil removal, installing 4" of gravel, setting posts , installing concrete slab (5"), installing wooden walls and retaining planks. Piles turned to go through a second heat cycle prior to final land application.

Feature Measure: Average daily mortality pounds per

Scenario Unit: Pounds per Day

Scenario Typical Size: 210.0

Scenario Total Cost: $26,480.13

Scenario Cost/Unit: $126.10

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formless, non reinforced	36	Non reinforced concrete cast-in-placed without forms by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$184.90	5.5	$1,016.95
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$372.36	22.5	$8,378.10
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$494.40	4	$1,977.60
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	27	$56.16
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.72	12	$608.64
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hours	$11.75	12	$141.00
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	160	$5,459.20
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	12	$317.52
Materials						

Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	18	$541.26
Dimension Lumber, Treated	1044	Treated dimension lumber with nominal thickness equal or less than 2". Includes lumber and fasteners	Board Feet	$1.14	4512	$5,143.68
Lumber, planks, posts and timbers, treated	1609	Treated dimension lumber with nominal thickness greater than 2". Includes lumber and fasteners. Does not include labor.	Board Feet	$1.97	1128	$2,222.16
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	1	$65.09
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	2	$317.06
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 316 - Animal Mortality Facility

Scenario: #7 - Extra Large Animal, Static Pile

Scenario Description:

This scenario consists of installing an impervious earthen pad to compost large animal mortalities, typically dairy cow, beef, sow or boar, in a static windrow or single pile. Additional carbon based bulking material is added to facilitate aeration and provide a proper C:N ratio. Piles turned at least once to go into another heat cycle prior to land application. Access is infrequent. This option requires at least 2 more times the area in vegetation for runoff treatment. This may not be an option for sites will limited areas, karst topography, and not isolated from of public view. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Any roofed portion of the facility will be addressed with Roofs and Covers (367). Any approach areas will be addressed with Heavy Use Area Protection (561). Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Diversion (362), Subsurface Drain (606), and Underground Outlet (620)). Vegetative Treatment Area (635), Composting (317), Roofs and Covers (367), Heavy Use Area Protection (561)

Before Situation:

Animal mortality is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from incomplete composting or interaction with predators. No plan was formulated for both normal and catastrophic mortality events.

After Situation:

Animal mortality is being done in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, complete composting, and protection from predators to minimize pathogen survival or spreading. An overall plan covers normal and catastrophic mortality events. Typical system consists of a 50' x 50' compacted earth surface. Site can handle mortality for a 100 cow dairy with associated heifers and calves. On site soils can be recompacted to meet required imperviousness. Include sufficient area for processing equipment access. Use single piles or windrows to minimize runoff. Site to be located out of drainage areas, off-site water diverted and any runoff to spread out into a grassed area or vegetated treatment area as per regulations. Site preparation includes removal of top 1.5' and recompacting.

Feature Measure: Pad Area

Scenario Unit: Square Feet

Scenario Typical Size: 2,500.0

Scenario Total Cost: $1,781.94

Scenario Cost/Unit: $0.71

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	140	$586.60
Excavation, common earth, large equipment, 150 ft	1223	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yards	$3.64	140	$509.60
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	1	$450.03

Practice: 316 - Animal Mortality Facility

Scenario: #8 - Extra Large Animal, Static Pile, Geologic Limitations

Scenario Description:

This scenario consists of installing a concrete pad over permeable soils, karst topography, frequently accessed sites or sites with regulatory requirements. Typically associated with large dairy (1,000 cows plus heifers), beef, boar or sow animal mortality. Area sized to compost animal mortality as a static pile or windrow with equipment around materials. Sufficient carbon based bulking material added to allow natural aeration and a proper C:N ratio. Piles typically turned at least once to go into another heat cycle prior to final disposal, typically land application. Site to be located out of drainage areas, off-site water diverted and any runoff to spread out into a grassed area or vegetated treatment area as per regulations. Any roofed portion of the facility will be addressed with Roofs and Covers (367). Any approach areas will be addressed with Heavy Use Area Protection (561). Potential Associated Practices: Fence (382), Critical Area Planting (342), Heavy Use Area Protection (561), Nutrient Management (590), Access Road (560), Diversion (362), Subsurface Drain (606), and Underground Outlet (620).

Before Situation:

Animal mortality is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from incomplete composting, incineration, or interaction with predators. No plan was formulated for both normal and catastrophic mortality events.

After Situation:

Animal mortality is being done in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, complete composting, and protection from predators to minimize pathogen survival or spreading. An overall plan covers normal and catastrophic mortality events. Typical system consists of a 60'x95' concrete surface to process an average mortality of 175 lb/day. Concrete 5" thick with light reinforcement. Typical layout is 18' wide piles with 8' wide access area is around each pile or windrow. Site preparation includes topsoil removal, minimal regrading and compaction, installing gravel or sand subbase and then concrete.

Feature Measure: Pad Area

Scenario Unit: Square Feet

Scenario Typical Size: 5,700.0

Scenario Total Cost: $36,774.14

Scenario Cost/Unit: $6.45

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$372.36	88	$32,767.68
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	106	$444.14
Excavation, common earth, large equipment, 150 ft	1223	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yards	$3.64	212	$771.68
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	70	$2,104.90
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	1	$450.03

Practice: 317 - Composting Facility

Scenario: #1 - Composter, with concrete under bins (wood or concrete) only

Scenario Description:

The composting facility, with concrete under bins only, is installed to address water quality concerns and disease vectors resulting from improper waste disposal by providing a dedicated facility for storage and treatment, and by creating a compost product that can be used in multiple ways including land application for enrichment of crop ground. All animal mortality composting shall be done using Practice Standard 316 - Animal Mortality Facility. Potential Associated Practices: Pond Sealing or Lining, Bentonite Sealant (521C), Pond Sealing or Lining, Compacted Clay Treatment (521D), Pond Sealing or Lining, Flexible Membrane (521A), Pond Sealing or Lining, Soil Dispersant (521B), Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Structure for water control (587), Diversion (362), Pipeline (516), Subsurface Drain (606), Heavy Use Area Protection (561), Roofs and Covers (367), Roof Runoff Structure (558), Waste Storage Facility (313), Waste Recycling (633), Waste Transfer (634), Underground Outlet (620) and Vegetative Treatment Area (635).

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This situation poses an environmentally threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

After Situation:

Manure and other agricultural by-products are being controlled, by the collection at the source, and stored properly, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan. The typical composter is designed to handle organic material from a 4 house poultry operation containing 20,000 4 lbs birds in each house. The typical bin is 40' x 32' with 5' high bins, 4-primary bins and 1 secondary bin. Strip top 1' of soil and roll compact same back into sub-floor. The entire structure is constructed on a 5" concrete slab used to store and stabilize organic material from a four house complex on any farm.

Feature Measure: Square Foot Floor Area

Scenario Unit: Square Feet

Scenario Typical Size: 1,280.0

Scenario Total Cost: $13,092.78

Scenario Cost/Unit: $10.23

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formless, non reinforced	36	Non reinforced concrete cast-in-placed without forms by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$184.90	2	$369.80
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$372.36	9	$3,351.24
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$494.40	2	$988.80
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	50	$209.50
Excavation, common earth, large equipment, 150 ft	1223	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yards	$3.64	50	$182.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	90	$2,177.10
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	10	$300.70
Dimension Lumber, Treated	1044	Treated dimension lumber with nominal thickness equal or less than 2". Includes lumber and fasteners	Board Feet	$1.14	1640	$1,869.60
Lumber, planks, posts and timbers, treated	1609	Treated dimension lumber with nominal thickness greater than 2". Includes lumber and fasteners. Does not include labor.	Board Feet	$1.97	936	$1,843.92
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	4	$1,800.12

Practice: 317 - Composting Facility

Scenario: #2 - Composter, whole concrete floor, wood or concrete bins

Scenario Description:

The composting facility, with complete concrete floor, equipment lane and under bins, is installed to address water quality concerns and disease vectors resulting from improper waste disposal by providing a dedicated facility for storage and treatment, and by creating a compost product that can be used in multiple ways including land application for enrichment of crop ground. This scenario is applicable when geological, soil or climate conditions prohibit the use of only partial concrete surfaces (bins only). All animal mortality composting shall be done using Practice Standard 316 - Animal Mortality Facility. Potential Associated Practices: Pond Sealing or Lining, Bentonite Sealant (521C), Pond Sealing or Lining, Compacted Clay Treatment (521D), Pond Sealing or Lining, Flexible Membrane (521A), Pond Sealing or Lining, Soil Dispersant (521B), Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Structure for water control (587), Diversion (362), Pipeline (516), Subsurface Drain (606), Heavy Use Area Protection (561), Roofs and Covers (367), Roof Runoff Structure (558), Waste Storage Facility (313), Waste Recycling (633), Waste Transfer (634), Underground Outlet (620) and Vegetative Treatment Area (635).

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This situation poses an environmentally threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

After Situation:

Manure and other agricultural by-products are being controlled, by the collection at the source, and stored properly, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan. The typical composter is designed to handle organic material from a 4 house poultry operation containing 20,000 4 lbs birds in each house. The typical bin is 40' x 32' with 5' high bins, 4-primary bins and 1 secondary bin. Strip top 1' of soil and roll compact same back into sub-floor. The entire structure is constructed on a 5" concrete slab used to store and stabilize organic material from a four house complex on any farm.

Feature Measure: Square Foot Floor Area

Scenario Unit: Square Feet

Scenario Typical Size: 1,280.0

Scenario Total Cost: $17,726.94

Scenario Cost/Unit: $13.85

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formless, non reinforced	36	Non reinforced concrete cast-in-placed without forms by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$184.90	2	$369.80
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$372.36	22	$8,191.92
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$494.40	2	$988.80
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	50	$209.50
Excavation, common earth, large equipment, 150 ft	1223	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yards	$3.64	50	$182.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	90	$2,177.10
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	22	$661.54
Dimension Lumber, Treated	1044	Treated dimension lumber with nominal thickness equal or less than 2". Includes lumber and fasteners	Board Feet	$1.14	1640	$1,869.60
Lumber, planks, posts and timbers, treated	1609	Treated dimension lumber with nominal thickness greater than 2". Includes lumber and fasteners. Does not include labor.	Board Feet	$1.97	648	$1,276.56
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	4	$1,800.12

Practice: 317 - Composting Facility

Scenario: #3 - Composter, windrow, all weather surface

Scenario Description:

The composting facility is installed to address water quality concerns and disease vectors resulting from improper waste disposal by providing a dedicated facility for storage and treatment, and by creating a compost product that can be used in multiple ways including land application for enrichment of crop ground. This scenario is applicable when geological, soil, climate conditions or state and local regulations prohibit the use of an earthen surface. All animal mortality composting shall be done using Practice Standard 316 - Animal Mortality Facility. Potential Associated Practices: Pond Sealing or Lining, Bentonite Sealant (521C), Pond Sealing or Lining, Compacted Clay Treatment (521D), Pond Sealing or Lining, Flexible Membrane (521A), Pond Sealing or Lining, Soil Dispersant (521B), Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Structure for water control (587), Diversion (362), Pipeline (516), Subsurface Drain (606), Heavy Use Area Protection (561), Roofs and Covers (367), Roof Runoff Structure (558), Waste Storage Facility (313), Waste Recycling (633), Waste Transfer (634), Underground Outlet (620) and Vegetative Treatment Area (635).

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This situation poses an environmentally threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

After Situation:

Manure and other agricultural by-products are being controlled, by the collection at the source, and stored properly, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan. This is incorporated as part of the overall waste management system meeting the National Engineering Handbook (NEH), Part 651, Agricultural Waste Management Field Handbook (AWMFH) that has been developed to also account for end use of the product from the composting facility. This scenario consists of installing a gravel pad over impervious soil to act as a working area to compost organic material in a static pile, windrow, that has sufficient carbon based bulking material to allow natural aeration. Piles typically turned at least once to go into another heat cycle prior to final deposal, typically land application. Typical pad 90' x 363' (3/4 acre) on an improved gravel surface. Sub base material sufficiently compacted or improved. Include sufficient area for processing equipment access. Single piles or windrows to minimize runoff. Site to be located out of drainage areas, off-site water diverted and any runoff to spread out into a grassed area or vegetated treatment area as per regulations. Site preparation includes topsoil removal, compaction of subsoil, and installing 6" of compacted gravel.

Feature Measure: Square Foot Floor Area

Scenario Unit: Square Feet

Scenario Typical Size: 32,670.0

Scenario Total Cost: $34,439.87

Scenario Cost/Unit: $1.05

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.37	3630	$4,973.10
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	1210	$5,069.90
Excavation, common earth, large equipment, 150 ft	1223	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yards	$3.64	1210	$4,404.40
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	605	$18,192.35
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	4	$1,800.12

Practice: 317 - Composting Facility

Scenario: #4 - Composter, with compacted earth floor, windrow

Scenario Description:

The composting facility is installed to address water quality concerns and disease vectors resulting from improper waste disposal by providing a dedicated facility for storage and treatment, and by creating a compost product that can be used in multiple ways including land application for enrichment of crop ground. This scenario is applicable when geological, soil, and climate conditions are appropriate for earth floors and are allowed by state and local regulations. All animal mortality composting shall be done using Practice Standard 316 - Animal Mortality Facility. Potential Associated Practices: Pond Sealing or Lining, Bentonite Sealant (521C), Pond Sealing or Lining, Compacted Clay Treatment (521D), Pond Sealing or Lining, Flexible Membrane (521A), Pond Sealing or Lining, Soil Dispersant (521B), Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Structure for water control (587), Diversion (362), Pipeline (516), Subsurface Drain (606), Heavy Use Area Protection (561), Roofs and Covers (367), Roof Runoff Structure (558), Waste Storage Facility (313), Waste Recycling (633), Waste Transfer (634), Underground Outlet (620) and Vegetative Treatment Area (635).

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This situation poses an environmentally threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

After Situation:

Manure and other agricultural by-products are being controlled, by the collection at the source, and stored temporarily, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan. This scenario consists of removing and compacting back into place the top 1' of soil to create a compacted, impervious earthen floor to act as a working area to compost organic material in a static pile, windrow, that has sufficient carbon based bulking material to allow natural aeration. Piles typically turned at least once to go into another heat cycle prior to final deposal, typically land application. Typical pad 90' x 363' (3/4 acre) on an improved compacted earthen surface. Include sufficient area for processing equipment access. Single piles or windrows to minimize runoff. Site to be located out of drainage areas, off-site water diverted and any runoff to spread out into a grassed area or vegetated treatment area as per regulations. Site preparation includes topsoil removal, compaction of subsoil, and reinstalling topsoil, compacted.

Feature Measure: Square Foot Floor Area

Scenario Unit: Square Feet

Scenario Typical Size: 32,670.0

Scenario Total Cost: $11,274.42

Scenario Cost/Unit: $0.35

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	1210	$5,069.90
Excavation, common earth, large equipment, 150 ft	1223	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yards	$3.64	1210	$4,404.40
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	4	$1,800.12

Practice: 318 - Short Term Storage of Animal Waste and By-Products

Scenario: #1 - Poly Cover, Earthen Pad

Scenario Description:

A compacted earthen pad is constructed to store wastes on a short-term basis between collection and utilization as part of an agricultural waste management system. This practice will address soil and water quality by reducing the pollution potential for surface water and groundwater quality degradation. Potential Associated Practices: Nutrient Management (590), Waste Recycling (633)

Before Situation:

Operator presently has a confined animal feeding operation and daily manure spreading operations are not possible due to weather. Manure and other agricultural waste by-products are not being managed in an environmentally safe manner. The wastes are either accumulating at the source, or are being stockpiled in environmentally vulnerable areas and not properly managed. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources.

After Situation:

Using a compacted earthen pad with a cover provides an environmentally safe meaure for temporarily managing manure and other agricultural waste by-products. This facility provides the landowner a means of storing waste until it can be utilized in a proper manner in accordance with a nutrient management plan. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Typical design: volume of material temporarily stored 12,576 ft3, pad area 6,000 ft2 (60' X 100'); 4' width around edge of manure stack to properly anchor and cover the manure; footprint of manure pile: 52' X 92", 6' manure stack height on 4:1 slopes; cover is a 6 mil poly film; 15" x 1/2" dia auger anchors on 2' centers.

Feature Measure: Volume of stored manure solids

Scenario Unit: Cubic Feet

Scenario Typical Size: 12,576.0

Scenario Total Cost: $6,461.45

Scenario Cost/Unit: $0.51

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	222	$930.18
Materials						
Poly film, 6 mil.	245	6 mil, polyethylene, black	Square Feet	$0.08	6324	$505.92
Earthfill Material, purchased, common	2060	Purchased earthfill materials includes both silt or clay. Material only.	Cubic Yards	$16.75	222	$3,718.50
Anchor, earthen, auger, 15 in.	2571	Very Low disturbance, galvanized or aluminum alloy earthen anchors (set of 6) with holding power of 500 pounds or less in normal soil. Includes materials and shipping only.	Each	$6.66	160	$1,065.60
Introduced Perennial Grasses, Legumes and/or Forbs, Low Density	2747	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$30.75	0.18	$5.54
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 319 - On-Farm Secondary Containment Facility

Scenario: #1 - Double Wall Tank

Scenario Description:

This practice scenario includes the replacement of an existing single wall fuel storage tank with a new double wall tank. The purpose of the practice is to address resource concerns related to water quality degradation due to the excessive release of organics into ground and surface waters or excessive sediment and turbidity in surface waters. Associated practices: Heavy Use Area Protection (561).

Before Situation:

The agricultural operation has an existing single wall fuel/oil storage tank(s) without any spill prevention protection. The producer has developed an SPCC plan in accordance with EPA requirements, which requires an above ground secondary containment facility for on-farm oil products.

After Situation:

This scenario is based on the replacement of an existing single wall tank(s) with a new double wall tank(s). Installation of "used" double wall tank(s) will not be allowed. A 3000 gallon horizontal or vertical antiroll tank (U/L 142-23 Secondary Containment Vessel) double walled which meets EPA regulations will be installed. Payment Schedule is based on the cost difference between a new single wall tank and new double wall tank of the same size. The double wall tank will provide an environmentally safe facility for handling and storage of oil products stored on the farm. Any accidental spills will be contained.

Feature Measure: Tank volume

Scenario Unit: Gallons

Scenario Typical Size: 3,000.0

Scenario Total Cost: $6,293.98

Scenario Cost/Unit: $2.10

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Crane, truck mounted, hydraulic, 12 ton	1734	12 ton capacity truck mounted hydraulic crane. Equipment cost only.	Hours	$59.71	2	$119.42
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	8	$272.96
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	8	$193.52
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	2	$67.28
Materials						
Tank, storage tank, upgrade to a double wall from a single wall, horizontal, steel, above ground, variable cost portion	2260	Variable cost portion of the difference between a single wall and double wall horizontal steel storage tank. Includes cradles, coating, fittings, labor, equipment. Excludes foundations, pumps or piping.	Gallons	$1.78	3000	$5,340.00
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	1	$65.09
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 319 - On-Farm Secondary Containment Facility

Scenario: #2 - Earthen Containment

Scenario Description:

This practice scenario includes the construction of an earthen containment wall with a flexible membrane liner around an existing storage tank. The containment will not have a roof. The purpose of the practice is to address resource concerns related to water quality degradation due to the excessive release of organics into ground and surface waters or excessive sediment and turbidity in surface waters. Associated practices: Heavy Use Area Protection (561).

Before Situation:

The agricultural operation has a single walled fuel/oil storage tank(s) without any spill prevention protection. The producer has developed an SPCC plan in accordance with EPA requirements, which requires an above ground secondary containment facility for on-farm oil products.

After Situation:

This scenario is based on containment for a 10,000 gallon tank. The containment will be lined with a flexible membrane liner. The containment volume is designed for 125% of the tank volume (10,000 gallons X 125% = 12,500 gallons). The bottom dimensions of the containment are 40 ft x 24 ft. The wall is 2.5 feet high with a 2 ft top width and 2:1 sideslopes. The total volume of earthfill = 114 CY. The flexible liner size = 1,872 SF. Tanks will be moved or raised to install base materials. Hauled in earthfill will be used to construct the dike. The flexible liner will be installed in conformance with the design and specifications. The completed structure will provide an environmentally safe facility for handling and storage of oil products stored on the farm. Any accidental spills will be contained.

Feature Measure: Cubic Yard of compacted earthen w

Scenario Unit: Cubic Yards

Scenario Typical Size: 114.0

Scenario Total Cost: $15,298.03

Scenario Cost/Unit: $134.19

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	126	$527.94
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.42	114	$389.88
Crane, truck mounted, hydraulic, 12 ton	1734	12 ton capacity truck mounted hydraulic crane. Equipment cost only.	Hours	$59.71	2	$119.42
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	4	$96.76
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	2	$67.28
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	18	$541.26
Pipe, PVC, 2 in., SCH 40	976	Materials: - 2 inch - PVC - SCH 40 - ASTM D1785	Feet	$1.27	50	$63.50
Geotextile, non-woven, heavy weight	1210	Non-woven greater than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only.	Square Yard	$1.55	208	$322.40
Synthetic Liner, 40 mil	1387	Synthetic 40 mil HDPE, LLDPE, EPDM, etc membrane liner material. Includes materials and shipping only.	Square Yard	$6.29	1872	$11,774.88
Fuel Containment Facility, Gate valve 2 inch diameter	1735	Metal 2 inch diameter gate valve. Materials only.	Each	$408.17	1	$408.17
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	1	$65.09
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	1	$450.03

Practice: 319 - On-Farm Secondary Containment Facility

Scenario: #3 - Corrugated Metal Wall Containment

Scenario Description:

This practice scenario includes the installation of a corrugated metal ring containment with a flexible membrane liner around an existing storage tank. The purpose of the practice is to address resource concerns related to water quality degradation due to the excessive release of organics into ground and surface waters or excessive sediment and turbidity in surface waters. Associated practices: Heavy Use Area Protection (561)

Before Situation:

The agricultural operation has a single walled fuel/oil storage tank(s) without any spill prevention protection. The producer has developed an SPCC plan in accordance with EPA requirements, which requires an above ground secondary containment facility for on-farm oil products.

After Situation:

This scenario is based on containment for a 10,000 gallon tank. The containment will be lined with a flexible membrane liner. The containment volume is designed for 125% of the tank volume (10,000 gallons X 125% = 12,500 gallons). The bottom dimensions of the containment are 26 ft x 24 ft. The corrugated panel wall is 2.75 feet high. The total area of wall = 275 SF. The flexible liner size = 930 SF. Tanks will be moved or raised to install base materials. The corrugated wall and flexible liner will be installed in conformance with the design and specifications. The completed structure will provide an environmentally safe facility for handling and storage of oil products stored on the farm. Any accidental spills will be contained.

Feature Measure: Square Ft of Corrugated Metal Wall

Scenario Unit: Square Feet

Scenario Typical Size: 275.0

Scenario Total Cost: $5,204.01

Scenario Cost/Unit: $18.92

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formless, non reinforced	36	Non reinforced concrete cast-in-placed without forms by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$184.90	1.5	$277.35
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	35	$146.65
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$100.83	2	$201.66
Crane, truck mounted, hydraulic, 12 ton	1734	12 ton capacity truck mounted hydraulic crane. Equipment cost only.	Hours	$59.71	2	$119.42
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	8	$272.96
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	96	$2,322.24
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	4	$134.56
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	12	$360.84
Pipe, PVC, 2 in., SCH 40	976	Materials: - 2 inch - PVC - SCH 40 - ASTM D1785	Feet	$1.27	40	$50.80
Deactivated. Fuel Containment Facility, corrugated metal panel wall with membrane liner, variable cost portion	1732	Variable cost portion of a secondary fuel containment facility including metal panels, support posts and flexible liner. Materials only.	Square Feet	$0.00	275	$0.00
Fuel Containment Facility, Gate valve 2 inch diameter	1735	Metal 2 inch diameter gate valve. Materials only.	Each	$408.17	1	$408.17
Deactivated. Fuel Containment Facility, corrugated metal panel wall with membrane liner, fixed cost portion	2061	Fixed cost portion of a secondary fuel containment facility including metal panels, support posts and flexible liner. This portion is the base cost for the system. Materials only.	Each	$0.00	1	$0.00
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	1	$65.09

Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	1	$450.03

Practice: 319 - On-Farm Secondary Containment Facility

Scenario: #4 - Concrete Containment Wall

Scenario Description:

This practice scenario includes the installation of a reinforced concrete wall containment with a concrete slab around an existing storage tank. The purpose of the practice is to address resource concerns related to water quality degradation due to the excessive release of organics into ground and surface waters or excessive sediment and turbidity in surface waters. Due to topography, limited site space and/or geological conditions a fabricated structure is needed. Structure will provide an environmentally safe facility for handling and storage of these products. Associated practices may include: Heavy Use Area Protection (561).

Before Situation:

Existing agricultural operation that has single walled fuel/oil storage tank(s) not protected. The producer has developed an SPCC plan in accordance with EPA requirements, that requires an above ground secondary containment facility for on-farm oil products, in order to control the excessive release of organics into ground and surface waters, or to control the excessive sediment and turbidity in surface water.

After Situation:

This scenario is based on containment for a 4,700 gallon tank. The containment volume is designed for 125% of the tank volume (4,700 gallons X 125% = 5,875 gallons). Structure will provide an environmentally safe facility for handling and storage of these products. Typical containment dimensions are 196 sqft bottom x 6" thick slab with 6" thick x 4' tall formed sidewalls. Tanks will be moved or raised to install base materials. The fabricated containment structure will be installed in conformance with the design and specifications. The on-farm oil products stored on the farm have secondary containment of accidental release that controls the excessive release of organics, suspended sediments, and turbidity. Structure will provide an environmentally safe facility for handling and storage of these products.

Feature Measure: Volume of concrete in the wall

Scenario Unit: Cubic Yards

Scenario Typical Size: 4.3

Scenario Total Cost: $5,144.14

Scenario Cost/Unit: $1,196.31

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$372.36	4.2	$1,563.91
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$494.40	4.3	$2,125.92
Crane, truck mounted, hydraulic, 12 ton	1734	12 ton capacity truck mounted hydraulic crane. Equipment cost only.	Hours	$59.71	2	$119.42
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	2	$67.28
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	4.2	$126.29
Pipe, PVC, 2 in., SCH 40	976	Materials: - 2 inch - PVC - SCH 40 - ASTM D1785	Feet	$1.27	30	$38.10
Fuel Containment Facility, Gate valve 2 inch diameter	1735	Metal 2 inch diameter gate valve. Materials only.	Each	$408.17	1	$408.17
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	1	$65.09
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 319 - On-Farm Secondary Containment Facility

Scenario: #5 - Modular Block Containment Wall

Scenario Description:

This practice scenario includes the installation of a modular block concrete wall containment with a flexible membrane liner over a 6" concrete floor. The purpose of the practice is to address resource concerns related to water quality degradation due to the excessive release of organics into ground and surface waters or excessive sediment and turbidity in surface waters. Due to topography, limited site space and/or geological conditions a fabricated structure is needed. Structure will provide an environmentally safe facility for handling and storage of these products. Associated practices may include: Heavy Use Area Protection (561),

Before Situation:

Existing agricultural operation that has single walled fuel/oil storage tank(s) without any spill prevention protection. The producer has developed an SPCC plan in accordance with EPA requirements, that requires an above ground secondary containment facility for on-farm oil products.

After Situation:

This scenario is based on containment for a 6,000 gallon tank. The containment volume is designed for 125% of the tank volume (6,000 gallons X 125% = 7,500 gallons). Structure will provide an environmentally safe facility for handling and storage of these products. The bottom dimensions of the containment are 26ft x 24ft. The 2ft x 2ft x 6ft modular blocks are stacked 2 high for a wall height of 4ft. The containment area is 624 sq.ft. The flexible liner size with a 2ft overlap and achored at the top of the modular block is 1224 sf. Tanks will be moved or raised to install base materials. The fabricated containment structure will be installed in conformance with the design and specifications. The on-farm oil products stored on the farm have secondary containment of accidental release that controls the excessive release of organics, suspended sediments, and turbidity. Structure will provide an environmentally safe facility for handling and storage of these products.

Feature Measure: secondary containment area

Scenario Unit: Square Feet

Scenario Typical Size: 624.0

Scenario Total Cost: $20,621.31

Scenario Cost/Unit: $33.05

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$372.36	16	$5,957.76
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$5.40	13	$70.20
Crane, truck mounted, hydraulic, 12 ton	1734	12 ton capacity truck mounted hydraulic crane. Equipment cost only.	Hours	$59.71	2	$119.42
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	2	$67.28
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic Yards	$28.74	13	$373.62
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	12	$360.84
Pipe, PVC, 2 in., SCH 40	976	Materials: - 2 inch - PVC - SCH 40 - ASTM D1785	Feet	$1.27	30	$38.10
Synthetic Liner, 40 mil	1387	Synthetic 40 mil HDPE, LLDPE, EPDM, etc membrane liner material. Includes materials and shipping only.	Square Yard	$6.29	1224	$7,698.96
Block, pre-cast concrete, modular	1496	Pre-cast concrete blocks, typically 2ft x 2ft x 6ft , includes installation and delivery.	Cubic Yards	$134.22	36	$4,831.92
Fuel Containment Facility, Gate valve 2 inch diameter	1735	Metal 2 inch diameter gate valve. Materials only.	Each	$408.17	1	$408.17
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	1	$65.09
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 320 - Irrigation Canal or Lateral

Scenario: #1 - Irrigation Canal

Scenario Description:

This scenario is the construction of an Irrigation Canal or Lateral. Typical construction dimensions are 4' wide bottom x 3' deep x 1320' length with a side slope of 2:1. Resource concerns: Excess/Insufficient Water - Inefficient Use of Irrigation Water. Associated Conservation Practices: 388-Irrigation Field Ditch; 443-Irrigation System, Surface or Subsurface; 533-Pumping Plant; 430-Irrigation Pipeline; 587 - Structure for Water Control; 449 - Irrigation Water Management

Before Situation:

Water supply for an area is inadequate for crop production and irrigation water application is inefficient.

After Situation:

An earthen canal that has adequate capacity to convey sufficient irrigation water to meet the demands of the system and make irrigation practical for the crops being grown.

Feature Measure: Volume of earth excavated

Scenario Unit: Cubic Yards

Scenario Typical Size: 1,467.0

Scenario Total Cost: $3,368.42

Scenario Cost/Unit: $2.30

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	1467	$3,051.36
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	2	$317.06

Practice: 324 - Deep Tillage

Scenario: #1 - Deep Tillage less than 20 inches

Scenario Description:

Fields (80 acres) with adverse soils conditions that restrict plant growth such as compacted layers caused by tillage operations or restrictive layers such as hardpans (duripans) in the root zone. This practice does not apply to normal tillage practices to prepare a seedbed but is meant to fracture the restrictive soil layer.

Before Situation:

In this geographic area, crop plants are observed as having reduced yield, water is not infiltrating into the soil. Soil layers have been compacted by shallow tillage operations, or soils have a hardpan (duripan) layer that is restricting root growth. Typical field size is 80 acres with crop rotations consisting of annual row crops or small grains with conventional tillage or when the harvesting of row crops (onions, sugar beets, potato, and corn silage) use heavy trucks to assist with the harvest. Compaction has been caused when soil moisture is too wet for normal field operations or by excessive shallow tillage or field harvest haul traffic throughout the entire field. Soil structure has been reduced, aggregate strength is weak and soil biological activity is low. Soil organic matter is not adequate and the water holding capacity of the soil is limited for the desired root zone.

After Situation:

Soil compaction is measured with a penetrometer and visual observation of limiting root growth. Deep tillage operations such as subsoiling, paratilling or ripping are performed not as a part of the normal tillage operation for seedbed preparation, but used to relieve compaction at depths less than 20 inches. Soil moisture is less than 30 percent when deep tillage is used. The fractured zone will be sufficient to permit root penetration below the restrictive soil layer. Penetrometers are used to identify the severity (psi) of the compaction and the depth of the restrictive layer. Deep tillage is generally performed in the fall after crop harvest when soil conditions are dry. After deep tillage, harvest operations should be avoided when soil moisture is greater than 50% of field capacity. Field harvest haul traffic should be limited to end rows or haul roads. Using dual tires or tracks beneath tractors or grain wagons can help spread the weight load.

Feature Measure: <Unknown>

Scenario Unit: Acres

Scenario Typical Size: 80.0

Scenario Total Cost: $1,820.29

Scenario Cost/Unit: $22.75

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	1	$22.29
Ripper or subsoiler, 16 to 36 inch depth	1235	Deep ripper or subsoiler, (16-36 inches depth) includes tillage implement, power unit and labor.	Acres	$19.09	80	$1,527.20
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	2	$48.38
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	2	$222.42

Practice: 324 - Deep Tillage

Scenario: #2 - Deep Tillage more than 20 inches

Scenario Description:

Fields (80 acres) with adverse soils conditions that restrict plant growth such as compacted layers caused by tillage operations or restrictive layers such as hardpans (duripans) in the root zone. This practice does not apply to normal tillage practices to prepare a seedbed but is meant to fracture the restrictive soil layer.

Before Situation:

In this geographic area, crop plants are observed as having reduced yield, water is not infiltrating into the soil. Soil layers have been compacted by shallow tillage operations, or soils have a hardpan (duripan) layer that is restricting root growth. Typical field size is 80 acres with crop rotations consisting of annual row crops, orchard /vineyards or small grains with conventional tillage or when the harvesting of row crops (onions, sugar beets, potato, and corn silage) use heavy trucks to assist with the harvest. Orchards and vineyards may be deep ripped prior to establishment of perennial crop. Compaction has been caused when soil moisture is too wet for normal field operations or by excessive shallow tillage or field harvest haul traffic throughout the entire field. Soil structure has been reduced, aggregate strength is weak and soil biological activity is low. Soil organic matter is not adequate and the water holding capacity of the soil is limited for the desired root zone.

After Situation:

Soil compaction is measured with a penetrometer and visual observation of limiting root growth. Deep tillage operations such as subsoiling, paratilling or ripping are performed not as a part of the normal tillage operation for seedbed preparation, but used to relieve compaction at depths more than 20 inches. Soil moisture is less than 30 percent when deep tillage is used. The fractured zone will be sufficient to permit root penetration below the restrictive soil layer. Penetrometers are used to identify the severity (psi) of the compaction and the depth of the restrictive layer. Deep tillage is generally performed in the fall after crop harvest when soil conditions are dry. When possible, harvest operations should be avoided when soil moisture is greater than 50% of field capacity. Field harvest haul traffic should be limited to end rows or haul roads. Using dual tires or tracks beneath tractors or grain wagons can help spread the weight load.

Feature Measure: <Unknown>

Scenario Unit: Acres

Scenario Typical Size: 80.0

Scenario Total Cost: $4,551.49

Scenario Cost/Unit: $56.89

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	1	$22.29
Ripper or subsoiler, > 36 inch depth	1236	Deep ripper or subsoiler, (>36 inches depth) includes tillage implement, power unit and labor.	Acres	$53.23	80	$4,258.40
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	2	$48.38
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	2	$222.42

Practice: 325 - High Tunnel System

Scenario: #27 - Contiguous US Snow

Scenario Description:

Used for contiguous US states in areas with high snowfall. A gothic style (peaked) manufactured frame of tubular steel (30 x 70 ft.) covered with 4-year 6 mil plastic. Costs are based on purchase of manufactured kit and landowner installing the structure. Structure must be installed to manufacturer's specifications.

Before Situation:

Cropland where extension of the growing season is needed. Additional resource concerns that may need to be addressed include soil erosion, soil condition, water quality, water quantity, and plant condition.

After Situation:

A high tunnel structure has been installed and he growing season has been extended for 1-4 months on average. Plant health and vigor has been improved.

Feature Measure: Area of Tunnel Installed

Scenario Unit: Square Feet

Scenario Typical Size: 2,160.0

Scenario Total Cost: $10,382.29

Scenario Cost/Unit: $4.81

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	71	$1,717.49
Materials						
Hoop House, gothic style, base package	1278	Includes heavy-duty, gothic framework complete with all predrilled steel, hardware and instructions. Includes 6 mil 4-year polyethylene film to cover tunnel, roll-up sides, lumber, and polylock for sides and ends for a gothic style (peaked top) hoop house. Materials only, does not include labor.	Square Feet	$3.78	2160	$8,164.80
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	500	$500.00

Practice: 325 - High Tunnel System

Scenario: #28 - Contiguous US

Scenario Description:

Used for contiguous US states in areas with low snowfall. A Quonset style (rounded) manufactured frame of tubular steel (30 x 72 ft.) covered with 4-year 6 mil plastic. Costs are based on purchase of manufactured kit and landowner installing the structure. Structure must be installed to manufacturer's specifications.

Before Situation:

Cropland where extension of the growing season is needed. Additional resource concerns that may need to be addressed include soil erosion, soil condition, water quality, water quantity, and plant condition.

After Situation:

A Quonset style high tunnel structure has been installed and the growing season has been extended for 1-4 months on average. Plant health and vigor has been improved.

Feature Measure: Area of Tunnel Installed

Scenario Unit: Square Feet

Scenario Typical Size: 2,160.0

Scenario Total Cost: $8,046.29

Scenario Cost/Unit: $3.73

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	71	$1,717.49
Materials						
Hoop House, quonset style, base package	1277	Includes the framework complete with all predrilled steel, hardware and instructions. Includes 6 mil 4-year polyethylene film to cover tunnel, and polylock for sides and ends for a quonset style (round top) hoop house. Materials and shipping only, does not include labor.	Square Feet	$2.93	2160	$6,328.80

Practice: 325 - High Tunnel System

Scenario: #29 - High Tunnel, Low Wind or Snow Load, Intensive Sun

Scenario Description:

Use in areas with low expected snow and wind loads. Quonset-style (round) manufactured frame of tubular steel (30 x 72 ft.) covered with 4-year 6 mil plastic. Because of extensive sun intensity, shade cloth is provided. Costs are based on purchase of manufactured kit and landowner installation of structure. Structure must be installed to manufacturer's specifications. Associated practices might include CPS Roof Runoff Structure (588), Underground Outlet (620), Critical Area Planting (342), Mulching (484)

Before Situation:

Cropland where extension of the growing season is needed. Primary resource concern addressed will be plant health and vigor. High sun intensity shortens growing season, or decreases crop quality.

After Situation:

High Tunnel structure has been installed and the growing season has been extended for 1-4 months on average. Shade cloth protects crops from high intensity of sun, allowing crop production and quality to continue into summer months. Plant health and vigor is improved.

Feature Measure: Area of Tunnel Installed

Scenario Unit: Square Feet

Scenario Typical Size: 2,160.0

Scenario Total Cost: $9,064.69

Scenario Cost/Unit: $4.20

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	71	$1,717.49
Materials						
Hoop House, quonset style, with shade cloth	2636	Includes the framework complete with all predrilled steel, hardware and instructions. Includes 6 mil 4-year polyethylene film to cover tunnel, polylock for sides and ends, and knitted shade cloth for a quonset style (round top) hoop house in southern climates. Materials and shipping only, does not include labor.	Square Feet	$3.17	2160	$6,847.20
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	500	$500.00

Practice: 326 - Clearing and Snagging

Scenario: #1 - Clearing and Snagging - Light

Scenario Description:

Removal of vegetation, logs, or other material that impedes the proper functioning on up to 200 linear feet of a stream channel or water course to restore flow capacity; prevent bank erosion by eddies; reduce the formation of sediment bars; and/or minimize blockages by debris. Addresses resource concerns such as water quantity and soil erosion-streambanks.

Before Situation:

Vegetation, logs, or other material provide a flow restriction or divert flowing water against the streambank causing excess erosion. Approximately one-third of the channel flow capacity is obstructed. The flow blockage may encourage depostion in the main channel and may alter the established flow channel.

After Situation:

Vegetation, logs, or other material have been removed to allow unrestricted flow in the channel and appurtenant structures. Material that poses no blockage threat is left in place to enhance aquatic habitat. Channel bed and banks are in equillibrium with the flow.

Feature Measure: Length of water course or channel

Scenario Unit: Feet

Scenario Typical Size: 200.0

Scenario Total Cost: $3,279.78

Scenario Cost/Unit: $16.40

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.89	6	$305.34
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$100.83	6	$604.98
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.59	12	$79.08
Truck, dump, 8 CY	1401	Dump truck for moving bulk material. Typically capacity is 12 ton or 8 cubic yards. Includes equipment only.	Hours	$54.27	8	$434.16
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	16	$387.04
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	24	$635.04
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	8	$362.72
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 326 - Clearing and Snagging

Scenario: #2 - Clearing and Snagging - Medium

Scenario Description:

Removal of vegetation, logs, or other material that impedes the proper functioning on 200 to 400 linear feet of a stream channel or water course to restore flow capacity; prevent bank erosion by eddies; reduce the formation of sediment bars; and/or minimize blockages by debris. Addresses resource concerns such as water quantity and soil erosion-streambanks.

Before Situation:

Vegetation, logs, or other material provide a flow restriction or divert flowing water against the streambank causing excess erosion. Approximately one-half of the channel flow capacity is obstructed. The flow blockage may encourage depostion in the main channel and may alter the established flow channel.

After Situation:

Vegetation, logs, or other material have been removed to allow unrestricted flow in the channel and appurtenant structures. Material that poses no blockage threat is left in place to enhance aquatic habitat. Channel bed and banks are in equillibrium with the flow.

Feature Measure: Length of water course or channel

Scenario Unit: Feet

Scenario Typical Size: 300.0

Scenario Total Cost: $4,807.88

Scenario Cost/Unit: $16.03

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$96.65	10	$966.50
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$100.83	10	$1,008.30
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.59	20	$131.80
Truck, dump, 8 CY	1401	Dump truck for moving bulk material. Typically capacity is 12 ton or 8 cubic yards. Includes equipment only.	Hours	$54.27	10	$542.70
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	16	$387.04
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	32	$846.72
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	10	$453.40
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 326 - Clearing and Snagging

Scenario: #3 - Clearing and Snagging - Heavy

Scenario Description:

Removal of vegetation, logs, or other material that impedes the proper functioning on over 400 linear feet of a stream channel or water course to restore flow capacity; prevent bank erosion by eddies; reduce the formation of sediment bars; and/or minimize blockages by debris. Addresses resource concerns such as water quantity and soil erosion-streambanks.

Before Situation:

Vegetation, logs, or other material provide a flow restriction or divert flowing water against the streambank causing excess erosion. Approximately two-thirds of the channel flow capacity is obstructed. The flow blockage may encourage depostion in the main channel and may alter the established flow channel.

After Situation:

Vegetation, logs, or other material have been removed to allow unrestricted flow in the channel and appurtenant structures. Material that poses no blockage threat is left in place to enhance aquatic habitat. Channel bed and banks are in equillibrium with the flow.

Feature Measure: Length of water course or channel

Scenario Unit: Feet

Scenario Typical Size: 400.0

Scenario Total Cost: $7,206.66

Scenario Cost/Unit: $18.02

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$96.65	16	$1,546.40
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$100.83	16	$1,613.28
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.59	30	$197.70
Truck, dump, 8 CY	1401	Dump truck for moving bulk material. Typically capacity is 12 ton or 8 cubic yards. Includes equipment only.	Hours	$54.27	16	$868.32
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	30	$725.70
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	40	$1,058.40
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	16	$725.44
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 327 - Conservation Cover

Scenario: #1 - Introduced Species

Scenario Description:

The land is covered with permanent non-native grass vegetation resulting in reduced soil erosion and water/sediment runoff, and the elimination of dust emissions which improves air quality significantly. Plants sown for conservation cover may provide cover for beneficial insects and wildlife. This scenario does not apply to plantings for forage production or to critical area plantings. Applies to conventional or organic systems.

Before Situation:

Crops such as corn, soybeans, or cotton may be conventionally or organically grown and harvested. Full width tillage is utilized, weeds controlled by cultivation and/or chemical application. Soil surface residue amounts average 10% or less. Soil erosion exceed allowable tolerance, sediment may be moving offsite into surface water degrading water quality. Soil quality (soil organic matter) declines over time as a result of tillage practices, low residue, and long periods of bare soil. Air quality may be impacted during field operations by the creation of particulates. The system provides little to no wildlife habitat.

After Situation:

The 327 Implementation Requirements have been developed for the site and applied. The land is covered with permanent non-native grass vegetation resulting in reduced soil erosion and water/sediment runoff, and the elimination of significant dust emissions which improves air quality. Plants sown for conservation cover may provide cover for beneficial insects and wildlife. This scenario does not apply to plantings for forage production or to critical area plantings.

Feature Measure: Area planted

Scenario Unit: Acres

Scenario Typical Size: 50.0

Scenario Total Cost: $7,775.50

Scenario Cost/Unit: $155.51

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	150	$1,483.50
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.12	50	$306.00
Mechanical weed control, Vegetation termination	957	Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs.	Acres	$18.86	50	$943.00
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	50	$1,015.50
Materials						
Nitrogen (N), Ammonium Nitrate	69	Price per pound of N supplied by Ammonium Nitrate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.58	2500	$1,450.00
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.52	2000	$1,040.00
Introduced Perennial Grasses, Legumes and/or Forbs, Low Density	2747	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$30.75	50	$1,537.50

Practice: 327 - Conservation Cover

Scenario: #2 - Native Species

Scenario Description:

This practice applies on land to be retired from agricultural production and on other lands needing permanent protective cover. This practice typically involves conversion from a clean-tilled (conventional tilled) intensive cropping system to permanent native vegetation (scenario includes native grass). The typical size of the practice is 50 acres. This practice scenario is typically used to reduce soil erosion, reduce soil quality degradation, improve water quality, develop wildlife habitat, and reduce air quality impacts. Applies to conventional or organic systems

Before Situation:

Crops such as corn, soybeans, or cotton may be conventionally or organically grown and harvested. Full width tillage is utilized, weeds controlled by cultivation and/or chemical application. Soil surface residue amounts average 10% or less. Soil erosion exceeds allowable tolerance, and sediment may be moving offsite into surface water degrading water quality. Soil quality (soil organic matter) declines over time as a result of tillage practices, low residue, and long periods of bare soil. Air quality may be impacted during field operations by the creation of particulates. The system provides little to no wildlife habitat.

After Situation:

The 327 Implementation Requirements have been developed for the site and applied. The land is covered with permanent native grass vegetation which reduces soil erosion and water/sediment runoff, and eliminates dust emissions which improves air quality. Plants sown for conservation cover may provide cover for beneficial insects and wildlife. This scenario does not apply to plantings for forage production or to critical area plantings.

Feature Measure: Area planted

Scenario Unit: Acres

Scenario Typical Size: 50.0

Scenario Total Cost: $9,951.50

Scenario Cost/Unit: $199.03

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	150	$1,483.50
Mechanical weed control, Vegetation termination	957	Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs.	Acres	$18.86	100	$1,886.00
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	50	$1,015.50
Materials						
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$111.33	50	$5,566.50

Practice: 327 - Conservation Cover

Scenario: #3 - Orchard or Vineyard Alleyways

Scenario Description:

This practice applies on orchards and vineyards needing permanent protective cover in the alleyways between tree and vine rows. The typical size of this practice is 20 acres. This practice typically involves conversion from a clean-tilled (conventional tilled) intensive cropping system to permanent vegetation (scenario includes non-native grass and legume mix). This practice scenario is typically used to reduce soil erosion, reduce soil quality degradation, improve water quality, enhance wildlife and/or pollinator habitat, manage plant pests, and reduce air quality impacts. Typically 60% of the surface area is conservation cover per acre.

Before Situation:

Orchard or vineyard with bare soil between vine/tree rows. Bare soil is exposed to wind erosion and/or intense rainfall during the fall, winter, and early spring. Over the winter sediment/nutrient runoff from orchards/vineyards increases. Soil erosion exceeds tolerable levels. Runoff from the fields flows into streams, water courses or other water bodies causing degradation to the receiving waters. Soil health (soil organic matter) declines over time as a result of long periods of bare soil. Little to no wildlife/pollinator habitat is present.

After Situation:

The 327 Implementation Requirements have been developed for the site and has been applied. Orchard or Vineyard area between vine/tree rows are planted with permanent introduced grass/legume mix. Area covered has reduced soil erosion, reduced water/sediment runoff, and improved air quality as a result of the elimination of significant amounts of dust emissions.. Plants sown for conservation cover may provide cover for beneficial insects, pollinators, and wildlife.

Feature Measure: Area planted

Scenario Unit: Acres

Scenario Typical Size: 20.0

Scenario Total Cost: $2,141.76

Scenario Cost/Unit: $107.09

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	24	$237.36
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.12	12	$73.44
Mechanical weed control, Vegetation termination	957	Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs.	Acres	$18.86	24	$452.64
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	12	$243.72
Materials						
Nitrogen (N), Ammonium Nitrate	69	Price per pound of N supplied by Ammonium Nitrate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.58	600	$348.00
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.52	480	$249.60
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.35	480	$168.00
Introduced Perennial Grasses, Legumes and/or Forbs, Low Density	2747	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$30.75	12	$369.00

Practice: 327 - Conservation Cover

Scenario: #4 - Pollinator Species

Scenario Description:

Permanent vegetation, including a mix of native grasses, legumes, and forbs (mix may also include non-native species), established on any land needing permanent vegetative cover that provides habitat for pollinators. Typical practice size is variable depending on site; this scenario uses 1 ac as the typical size. In addition to providing pollinator habitat, this practice scenario may also reduce sheet, rill, and wind erosion, improve soil quality, improve water quality, and improve air quality. The practice may also provide wildlife habitat. Practice applicable on cropland, odd areas, corners, etc. Applies to conventional or organic systems.

Before Situation:

Crops such as corn, soybeans, or cotton may be conventionally or organically grown and harvested. Full width tillage is utilized, weeds controlled by cultivation and/or chemical application. Soil surface residue amounts average 10% or less. Erosion exceeds tolerable rates and sediment may be moving offsite into surface water degrading water quality. Soil quality (soil organic matter) declines over time as a result of tillage practices, low residue, and long periods of bare soil. Air quality may be impacted during field operations by the creation of particulates. The system provides little to no wildlife or pollinator habitat.

After Situation:

The 327 Implementation Requirements have been developed for the site and applied. Land is covered with permanent pollinator habitat including a mix of native grasses, legumes, forbs (mix may also include non-native species). This practice may also have reduced soil erosion, reduced water/sediment runoff, and improved air quality as a result of the elimination of dust emissions. Plants sown for pollinator habitat may also provide cover for beneficial insects and wildlife. This scenario does not apply to critical area plantings.

Feature Measure: Area planted

Scenario Unit: Acres

Scenario Typical Size: 1.0

Scenario Total Cost: $705.25

Scenario Cost/Unit: $705.25

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	1	$22.29
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	3	$29.67
Mechanical weed control, Vegetation termination	957	Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs.	Acres	$18.86	2	$37.72
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	1	$20.31
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	4	$136.48
Materials						
Native Perennial Grasses, Legumes and/or Forb Mix for Targeted Wildlife/Pollinator Habitat or Ecological Restoration, moderate commercial availability	2619	Diverse mix of native perennial grasses, legumes and forbs, less than 50% grasses, may include biennials and a small percentage of annual species for establishment purposes and/or if allowed by the CPS. This is a mix composed of species required to meet specific wildlife/pollinator habitat or ecological requirements. Seed is moderately easy to purchase commercially. Includes materials and shipping.	Acres	$458.78	1	$458.78

Practice: 327 - Conservation Cover

Scenario: #22 - Monarch Species Mix

Scenario Description:

Establish permanent vegetative cover for pollinator habitat according to state specifications. Typically used for high quality nectar and pollen species. Assumes seed/plugs, equipment and labor for seed bed prep/planting, and weed management during establishment. Used for conventional or organic land on small, intensive areas that are central to specialty crop production. Not typically used for large-scale plantings. This is applicable to both organic and non-organic conditions.

Before Situation:

Old hayfields that are mowed typically in the fall lack milkweed needed for monarchs. Other crops such as corn, soybeans, or cotton are conventionally grown and harvested. The system provides little to no wildlife or pollinator habitat.

After Situation:

The 327 Implementation Requirements have been developed and applied for the site. Land covered with permanent monarch habitat including a mix of milkweed species, native grasses, legumes, and forbs. Plants sown for monarch habitat may also provide cover for beneficial insects and wildlife.

Feature Measure: area planted

Scenario Unit: Acres

Scenario Typical Size: 1.0

Scenario Total Cost: $888.76

Scenario Cost/Unit: $888.76

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	1	$22.29
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	3	$29.67
Mechanical weed control, Vegetation termination	957	Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs.	Acres	$18.86	2	$37.72
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	1	$20.31
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	4	$136.48
Materials						
Native Perennial Grasses, Legumes and/or Forb Mix for Targeted Wildlife/Pollinator Habitat or Ecological Restoration, moderate commercial availability	2619	Diverse mix of native perennial grasses, legumes and forbs, less than 50% grasses, may include biennials and a small percentage of annual species for establishment purposes and/or if allowed by the CPS. This is a mix composed of species required to meet specific wildlife/pollinator habitat or ecological requirements. Seed is moderately easy to purchase commercially. Includes materials and shipping.	Acres	$458.78	1.4	$642.29

Practice: 327 - Conservation Cover

Scenario: #67 - Native Species, Foregone income, Irrigated Crop

Scenario Description:

This practice applies on conventional or organically managed, IRRIGATED, land needing permanent protective cover. This practice typically involves conversion from an intensive cropping system to permanent native vegetation (scenario includes native grass/legume mix). The typical size of the practice is 50 acres. This practice scenario is typically used to reduce soil erosion, reduce soil quality degradation, improve water quality, develop wildlife habitat, and reduce air quality impacts. Applies to conventional or organic systems.

Before Situation:

A monoculture crop, grown conventionally or organically, is irrigated and harvested. Full width tillage is utilized, weeds controlled mainly by cultivation. Soil surface residue amounts average 10% or less. Soil erosion exceeds tolerable rates and sediment may be moving offsite into surface water degrading water quality. Soil quality (soil organic matter) declines over time as a result of tillage practices, low residue, and long periods of bare soil. Air quality may be impacted during field operations by the creation of particulates. The system provides little to no wildlife habitat.

After Situation:

The 327 Implementation Requirements have been developed for the site and applied. Managed land covered with permanent native grass/legume mix vegetation has reduced soil erosion, reduced water/sediment runoff, and improved air quality due to the elimination of dust emissions. Plants sown for conservation cover may provide cover for beneficial insects and wildlife. This scenario does not apply to plantings for forage production or to critical area plantings.

Feature Measure: Acres of conservation cover plante

Scenario Unit: Acres

Scenario Typical Size: 50.0

Scenario Total Cost: $24,141.50

Scenario Cost/Unit: $482.83

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	150	$1,483.50
Mechanical weed control, Vegetation termination	957	Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs.	Acres	$18.86	100	$1,886.00
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	50	$1,015.50
Foregone Income						
FI, Corn Irrigated	1960	Irrigated Corn is Primary Crop	Acres	$347.18	50	$17,359.00
Materials						
Annual Grasses, Legumes or Forbs	2732	A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$47.95	50	$2,397.50

Practice: 327 - Conservation Cover

Scenario: #86 - Native Species with Forgone Income

Scenario Description:

This practice applies on conventional or organically managed land needing permanent protective cover. This practice typically involves conversion from an intensive cropping system to permanent native vegetation (scenario includes native grass/legume mix). The typical size of the practice is 50 acres. This practice scenario is typically used to reduce soil erosion, reduce soil quality degradation, improve water quality, develop wildlife habitat, and reduce air quality impacts. Applies to conventional or organic systems.

Before Situation:

Crops such as vegetables and small fruit crops may be conventionally or organically grown and harvested. Full width tillage is utilized, weeds controlled mainly by cultivation. Soil surface residue amounts average 10% or less. Soil erosion exceeds tolerable rates and sediment may be moving offsite into surface water degrading water quality. Soil quality (soil organic matter) declines over time as a result of tillage practices, low residue, and long periods of bare soil. Air quality may be impacted during field operations by the creation of particulates. The system provides little to no wildlife habitat.

After Situation:

The 327 Implementation Requirements have been developed for the site and applied. Managed land covered with permanent native grass/legume mix vegetation has reduced soil erosion, reduced water/sediment runoff, and improved air quality due to the elimination of dust emissions. Plants sown for conservation cover may provide cover for beneficial insects and wildlife. This scenario does not apply to plantings for forage production or to critical area plantings.

Feature Measure: Area planted

Scenario Unit: Acres

Scenario Typical Size: 50.0

Scenario Total Cost: $21,539.50

Scenario Cost/Unit: $430.79

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	150	$1,483.50
Mechanical weed control, Vegetation termination	957	Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs.	Acres	$18.86	100	$1,886.00
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	50	$1,015.50
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$215.46	25	$5,386.50
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$248.06	25	$6,201.50
Materials						
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$111.33	50	$5,566.50

Practice: 327 - Conservation Cover

Scenario: #87 - Pollinator Species with Forgone Income

Scenario Description:

Permanent vegetation, including a mix of native grasses, legumes, and forbs (mix may also include non-native species), established on land needing permanent vegetative cover that provides habitat for pollinators. Typical practice size is variable depending on site; this scenario uses 1 ac as the typical size. In addition to providing pollinator habitat, this practice scenario may also reduce sheet and rill erosion, improve soil quality, improve water quality, and improve air quality. The practice may also provide wildlife habitat. Practice applicable on cropland, odd areas, corners, etc. Applies to conventional or organic systems.

Before Situation:

Crops such as vegetables and small fruit crops may be conventionally or organically grown and harvested. Full width tillage is utilized, weeds controlled mainly by cultivation. Soil surface residue amounts average 10% or less. Soil erosion exceeds tolerable rates and sediment may be moving offsite into surface water degrading water quality. Soil quality (soil organic matter) declines over time as a result of tillage practices, low residue, and long periods of bare soil. Air quality may be impacted during field operations by the creation of particulates. The system provides little to no wildlife or pollinator habitat.

After Situation:

The 327 Implementation Requirements have been developed for the site and applied. Managed land covered with permanent pollinator habitat including a mix of native grasses, legumes, and forbs (mix may also include non-native species). This practice may also reduce soil erosion, reduce water/sediment runoff, and improve air quality due to the elimination of dust emissions. Plants sown for pollinator habitat may also provide cover for beneficial insects and wildlife. This scenario does not apply to critical area plantings.

Feature Measure: Area planted

Scenario Unit: Acres

Scenario Typical Size: 1.0

Scenario Total Cost: $778.24

Scenario Cost/Unit: $778.24

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	3	$29.67
Mechanical weed control, Vegetation termination	957	Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs.	Acres	$18.86	2	$37.72
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	1	$20.31
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$215.46	0.5	$107.73
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$248.06	0.5	$124.03
Materials						
Native Perennial Grasses, Legumes and/or Forb Mix for Targeted Wildlife/Pollinator Habitat or Ecological Restoration, moderate commercial availability	2619	Diverse mix of native perennial grasses, legumes and forbs, less than 50% grasses, may include biennials and a small percentage of annual species for establishment purposes and/or if allowed by the CPS. This is a mix composed of species required to meet specific wildlife/pollinator habitat or ecological requirements. Seed is moderately easy to purchase commercially. Includes materials and shipping.	Acres	$458.78	1	$458.78

Practice: 328 - Conservation Crop Rotation

Scenario: #1 - Basic Rotation Organic and Non-Organic

Scenario Description:

In this region this practice may be part of a conservation management system on both organic and non-organic operations to: 1) Reduce sheet, rill and wind erosion, 2) Maintain or increase soil health and organic matter content, 3) Reduce water quality degradation due to excess nutrients, 4) Improve soil moisture efficiency, 5) Reduce the concentration of salts and other chemicals from saline seeps, 6) Reduce plant pest pressures, 7) Provide feed and forage for domestic livestock, and 8) Provide food and cover habitat for wildlife, including pollinator forage, and nesting. This practice payment is provided to the producer for the time needed to plan and implement the logistics of changing the rotation to effectively implement a conservation crop rotation on a typical 200 acre cropland farm. No foregone income. Cost represents typical situations for conventional and organic producers.

Before Situation:

The rotation consists primarily of low residue producing row crops. Fields range from nearly flat to C and D slopes. Erosion, soil quality, and pest management are the primary concerns.

After Situation:

A rotation is established that provides additional high residue and/or perennial crops that may treat one or more of the following purposes: reduce sheet, rill and wind erosion, maintain or increase soil health and organic matter content, reduce water quality degradation due to excess nutrients, improve soil moisture efficiency, reduce the concentration of salts and other chemicals from saline seeps, reduce plant pest pressures, provide feed and forage for domestic livestock, or provide food and cover habitat for wildlife, including pollinator forage, and nesting.

Feature Measure: Area planted

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $1,360.20

Scenario Cost/Unit: $13.60

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	30	$1,360.20

Practice: 328 - Conservation Crop Rotation

Scenario: #5 - Specialty Crops Organic and Non-Organic

Scenario Description:

In this region a rotation of organic or non-organic specialty crops (fruits and vegetable) are produced as part of a conservation management system to treat one or more of the following resource concerns: 1) Reduce sheet, rill and wind erosion, 2) Maintain or increase soil health and organic matter content, 3) Reduce water quality degradation due to excess nutrients, 4) Improve soil moisture efficiency, 5) Reduce the concentration of salts and other chemicals from saline seeps, 6) Reduce plant pest pressures, 7) Provide feed and forage for domestic livestock, and 8) Provide food and cover habitat for wildlife, including pollinator forage, and nesting. This practice payment is provided to acquire the technical knowledge and skills necessary to effectively implement a conservation crop rotation on a typical 50 acre specialty crop farm. No foregone income. Cost represents typical situations for organic and non-organic producers.

Before Situation:

This rotation consisted of growing specialty crops. Fields range from nearly flat to B and C slopes. Erosion, soil quality, and pest management are the primary concerns.

After Situation:

The rotation established adds higher residue crop(s) to the rotation that will treat one or more of the following resource concerns on organic and non- organic farms: 1) Reduce sheet, rill and wind erosion, 2) Maintain or increase soil health and organic matter content, 3) Reduce water quality degradation due to excess nutrients, 4) Improve soil moisture efficiency, 5) Reduce the concentration of salts and other chemicals from saline seeps, 6) Reduce plant pest pressures, 7) Provide feed and forage for domestic livestock, and 8) Provide food and cover habitat for wildlife, including pollinator forage, and nesting.

Feature Measure: Area planted

Scenario Unit: Acres

Scenario Typical Size: 50.0

Scenario Total Cost: $1,813.60

Scenario Cost/Unit: $36.27

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	40	$1,813.60

Practice: 328 - Conservation Crop Rotation

Scenario: #63 - Rice Residue Management for Waterfowl

Scenario Description:

The resource concern is food and cover for waterfowl where rice is grown in the waterfowl flyway zones. This scenario manages the rice residue after rice harvest to enhance the food and cover for waterfowl. The payment for the practice scenario is based on the cost to roll alternate strips of rice residue flat while leaving the alternate strips of rice residue left undisturbed after rice harvest.

Before Situation:

The typical situation after rice harvest is tilling the soil to bury or mix the rice residue remaining after harvest into the soil. This results in virtually no food or cover for the waterfowl that traverse the waterfowl flyways.

After Situation:

The rice residue after rice harvest will remain standing except for the alternate strip of the rice residue rolled almost flat to provide alternate strip of both cover and food. The rice residue will be left in this condition until the following spring.

Feature Measure: Residue Cover

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $400.00

Scenario Cost/Unit: $4.00

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acres	$8.00	50	$400.00

Practice: 328 - Conservation Crop Rotation

Scenario: #79 - Irrigated to Dryland Rotation Organic and Non-Organic

Scenario Description:

In this region this practice may be part of a conservation management system to primarily convert from an irrigated cropping system to dryland farming. In addition to improving water use efficiency the rotation may: 1) Reduce sheet, rill and wind erosion, 2) Maintain or increase soil health and organic matter content, 3) Reduce water quality degradation due to excess nutrients, 4) Improve soil moisture efficiency, 5) Reduce the concentration of salts and other chemicals from saline seeps, 6) Reduce plant pest pressures, 7) Provide feed and forage for domestic livestock, and 8) Provide food and cover habitat for wildlife, including pollinator forage, and nesting. This practice payment is provided to acquire the technical knowledge and skills necessary to effectively implement a conservation crop rotation on a typical 200 acre cropland farm. There is foregone income involved with this conversion from irrigated to dryland farming due to lower yields and net return. Cost represents typical situations for conventional (non-organic) producers converting from irrigated cropping to dryland farming.

Before Situation:

This rotation consisted of growing row crop grains that received a significant (more than half) of the required water via irrigation. The water demands are impacting the area's water availability. Erosion, soil condition, and future water availability are the major concerns.

After Situation:

The dryland rotation, using the same crops or a rotation that grows crops over different periods, will be part of a management system capable of utilizing available rainfall and soil moisture more efficiently and controlling wind and water erosion. Corn yields will be expected to be reduced from 150 to 80 bu/acre.

Feature Measure: Area planted

Scenario Unit: Acres

Scenario Typical Size: 200.0

Scenario Total Cost: $27,704.20

Scenario Cost/Unit: $138.52

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$215.46	-200	($43,092.00)
FI, Corn Irrigated	1960	Irrigated Corn is Primary Crop	Acres	$347.18	200	$69,436.00
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	30	$1,360.20

Practice: 329 - Residue and Tillage Management, No Till

Scenario: #1 - No-Till/Strip-Till

Scenario Description:

This practice typically involves conversion from a clean-tilled (conventional tilled) system to no-till or strip-till system on 100 acres of cropland. This involves managing the amount, orientation and distribution of crop and other plant residue on the soil surface year round while limiting soil-disturbing activities used to establish and harvest crops. The practice is used to reduce sheet and rill erosion, reduce wind erosion, improve soil quality, reduce CO2 losses from the soil, reduce energy use, increase plant available moisture and provide food and escape cover for wildlife. The no-till/strip-till system includes non-tillage types of weed control and may also include a period of no till fallow. System is applicable in both irrigated and non-irrigated fields of organic and non-organic operations.

Before Situation:

Row crops or small grains are grown and harvested. Full width tillage is performed prior to planting and weed control during crop production is typically cultivation and chemical application. Fields are disked immediately following harvest, with additional operations in some fields to facilitate drainage, seedbed preparation or additional weed control. Residue amounts after tillage operations average 10% or less, resulting in bare soil being exposed to wind erosion and/or intense rainfall. Any crop residue that is present degrades and sediment/nutrient runoff from fields increases during rainfall events. Sheet and rill erosion occurs with visible rills by spring. Soil health (soil organic matter) declines over time as a result of tillage practices, low residue, and long periods of bare soil. This system will typically have a negative Soil Conditioning Index (SCI) and a high Soil Tillage Intensity Rating (STIR).

After Situation:

The Implementation Requirements for 329 Residue Management, No Till is prepared and installed. Managing crop residue on the surface of a field (typical 100 acre) year around according to the 329 practice plan while limiting soil disturbing activities to those which place nutrients, and plant crops that meet the minimum criteria in the 329 practice standard. All crops are seeded/planted with a no-till drill or no-till/strip-till planter, which minimizes soil disturbance while establishing good seed-soil contact. All residues are to be maintained on the soil surface in a uniform distribution over the entire field and not burned or removed. Crop residues provide soil surface cover throughout the year. Runoff and erosion are reduced and no rills are visible on the soil surface. Wind erosion is reduced by standing residues and surface cover. Over time, soil health is improved due to the additional biomass (crop residues), ground cover, and soil infiltration. Crop residues and/or cover crop residues left on the soil surface may maximize weed control by increasing allelopathic and mulching effect, and provides cover for wildlife. The practice would require reducing soil disturbance and erosion and increasing biomass returned to the soil in sufficient amounts to achieve increased SCI and decreased STIR.

Feature Measure: Area planted

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $2,031.00

Scenario Cost/Unit: $20.31

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	100	$2,031.00

Practice: 329 - Residue and Tillage Management, No Till

Scenario: #3 - No Till Adaptive Management

Scenario Description:

The practice scenario is for the implementation of no till in small replicated plots to allow the producer to learn how to manage no till on their operation. Scenario includes implementing replicated strip trials on a field plot to evaluate, identify and implement a particular no till management strategy (e.g., no till vs conventional till, drill vs planter, strip till vs no till, residue row cleaners, vs no row cleaners, etc.) This will be done by following the Agronomy Technical Note 10 - Adaptive Management.

Before Situation:

Row crops or small grains are grown and harvested. Full width tillage is performed prior to planting and weed control during crop production is typically cultivation and chemical application. Fields are disked immediately following harvest, with additional operations in some fields to facilitate drainage or additional weed control. Residue amounts after tillage operations average 10% or less, resulting in bare soil being exposed to wind erosion and/or intense rainfall. Any crop residue that is present degrades and sediment/nutrient runoff from fields increases during rainfall events. Sheet and rill erosion exceeds soil loss tolerances. Soil health (soil organic matter) declines over time as a result of tillage practices, low residue, and long periods of bare soil. This system will typically have a negative Soil Conditioning Index (SCI) and a high Soil Tillage Intensity Rating (STIR). The producer is considering using no till technology, but is unsure how to manage on their operation or needs to improve the management of no till to be successful.

After Situation:

Implementation Requirements are prepared and an Adaptive Management Plan for the plots is developed and implemented. Installation of this scenario will result in establishment of no till replicated plots to compare to different management strategies for no till and other residue management strategies following the guidance in the Agronomy Technical Note 10 - Adaptive Management Process. Implementation involves establishing the replicated plots to evaluate one or more no till management strategies. The plot will consist of at least 4 replicated plots designed, laid out, managed and evaluated with the assistance of a consultant knowledgeable in no till management. Results are used to make no till management decisions to address erosion, soil health, and water quality issues. Yields will be measured and statistically summarized following the procedures in Agronomy Technical Note 10 - Adaptive Management. The yields for each plot will be adjusted to the appropriate moisture content. This would be repeated for 3 years.

Feature Measure: Based on 15 acre plots

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $3,479.50

Scenario Cost/Unit: $3,479.50

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	7.5	$152.33
Seeding Operation, No Till/Strip Till Planter	1230	No Till/Strip Till row planters for seeding. Includes all costs for equipment, power unit, and labor.	Acres	$18.05	7.5	$135.38
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	40	$967.60
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	20	$2,224.20

Practice: 330 - Contour Farming

Scenario: #1 - Contour Farming

Scenario Description:

This scenario meets the specifications of the NRCS Contour Farming Standard. This scenario applies to fields greater than 5 acres. Payment reflects the extra labor and initial supervision costs in laying out and implementing contour farming. Annual erosion rates for the rotation exceeds tolerance levels. Excessive runoff leads to sedimentation of waterways

Before Situation:

The typical field size in this geographical region for this scenario is 30 acres. The field slope averages 6% while the slope length averages 160 feet. All farming operations on this cropland field including disking, bedding, planting, and cultivation are performed generally up and down the slope. Annual erosion rates for the rotation exceeds tolerance levels. Excessive runoff leads to sedimentation of waterways.

After Situation:

Implementation Requirements are prepared and implemented according to 330 Contour Farming. This practice is installed on the entire field. A survey is completed by trained and certified Federal, State, local personnel or consultant to determine and "stake" contour row arrangement. Permanent row markers are established to ensure that this practice is maintained for the life of this practice. All field operations including disking, bedding, planting, and cultivation are performed on the contour which is near perpendicular to the field slope. The farm manager is initially on site to ensure that equipment operators are properly following contour methods. Soil erosion rates are reduced by nearly half and may be below tolerance depending on the rotation. Likewise, sedimentation has been significantly reduced.

Feature Measure: acre

Scenario Unit: Acres

Scenario Typical Size: 30.0

Scenario Total Cost: $290.61

Scenario Cost/Unit: $9.69

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	1	$22.29
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	5	$132.30
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	3	$136.02

Practice: 331 - Contour Orchard and Other Perennial Crops

Scenario: #1 - Contour Orchards/Vineyards

Scenario Description:

This scenario meets the specifications of the NRCS 331 Contour Orchards and Perennial Crops Standard. This scenario applies to fields greater than 5 acres. Payment reflects the extra labor and initial supervision costs in implementing and following contour operations compared to other methods. More time is usually needed when following contour operations due to more equipment time in shorter rows and more equipment turning. Annual erosion rates for the rotation exceeds tolerance levels. Excessive runoff leads to sedimentation of waterways.

Before Situation:

The typical field size in this geographical region for this scenario is 10 acres. The field slope averages 6% while the slope length averages 160 feet. All farming operations are performed up and down the slope. Annual erosion rates for the rotation exceeds tolerance levels. Excessive runoff leads to sedimentation of waterways.

After Situation:

Implementation Requirements are prepared and implemented according to the Contour Orchards and Perennial Crops Standard (331). This practice is installed on the entire field. All field operations including: harvesting, disking, bedding, and planting are performed on the contour which is near perpendicular to the field slope. The farm manager is initially on site to ensure that equipment operators are properly following contour methods. Soil erosion rates are reduced to tolerable soil loss levels. Likewise, sedimentation has be significantly reduced.

Feature Measure: acre

Scenario Unit: Acres

Scenario Typical Size: 10.0

Scenario Total Cost: $290.61

Scenario Cost/Unit: $29.06

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	1	$22.29
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	5	$132.30
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	3	$136.02

Practice: 332 - Contour Buffer Strips

Scenario: #15 - Wildlife/Pollinator, Foregone Income (Organic and Non-Organic)

Scenario Description:

Narrow strips of permanent, herbaceous vegetative cover established around the hill slope and alternated down the slope with wider cropped strips in between that are farmed on the contour. This practice applies to all cropland. Practice includes seedbed prep and planting of mainly pollinator friendly species. The area of the field border is taken out of production. This applies to organic and no-organic.

Before Situation:

Water Erosion Calculator (e.g. RUSLE2) indicates that there is a significant amount of sheet and rill erosion and/or a significant amount of sediment potentially delivered to the downslope edge of the field. A secondary concern is that there may not be enough wildlife/pollinator habitat, food source or refugia in the field or farm.

After Situation:

Plant species will be established in strips in the field to meet the Contour buffer Strips (332) criteria, resource needs, producer objectives, and the targeted wildlife/pollinators necessary food and/or cover. Minimum widths shall be based on NRCS local design criteria specific to the purpose for installing the practice. Species selected shall meet the wildlife/pollinator habitat requirements of the state and be adapted to site; not function as a host for diseases of a field crop and; have physical characteristics necessary to control sheet and rill erosion to tolerable levels on the cropped area of the field.

Feature Measure: Number of acres

Scenario Unit: Acres

Scenario Typical Size: 1.0

Scenario Total Cost: $361.65

Scenario Cost/Unit: $361.65

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	1	$5.34
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	1	$20.31
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$215.46	1	$215.46
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$9.21	1	$9.21
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$111.33	1	$111.33

Practice: 332 - Contour Buffer Strips

Scenario: #16 - Native Species, Foregone Income (Organic and Non-organic)

Scenario Description:

Narrow strips of permanent, herbaceous vegetative cover established around the hill slope and alternated down the slope with wider cropped strips in between that are organically or non-organically farmed on the contour. This practice applies to all cropland. Practice includes seedbed prep and planting of native species. The area of the contour grass strip is taken out of production.

Before Situation:

The NRCS water erosion prediction software indicates that there is a significant amount of sheet and rill erosion and/or a significant amount of sediment potentially delivered to the downslope edge of the field. A secondary concern is that there may not be enough wildlife/pollinator habitat, food source or refugia in the field or farm.

After Situation:

Native grasses, legumes and forbs will be established in strips in the field to meet the Contour buffer Strips (332) criteria, resource needs, and producer objectives. Minimum widths shall be based on NRCS local design criteria specific to the purpose for installing the practice. Native species shall be selected that do not function as a host for diseases of a field crop and have physical characteristics necessary to control water erosion to tolerable levels in the cropped area of the field.

Feature Measure: number of acres

Scenario Unit: Acres

Scenario Typical Size: 1.0

Scenario Total Cost: $361.65

Scenario Cost/Unit: $361.65

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	1	$5.34
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	1	$20.31
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$215.46	1	$215.46
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$9.21	1	$9.21
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$111.33	1	$111.33

Practice: 332 - Contour Buffer Strips

Scenario: #17 - Introduced Species, Foregone Income (Organic and Non-Organic)

Scenario Description:

Narrow strips of permanent, herbaceous vegetative cover established around the hill slope and alternated down the slope with wider cropped strips in between that are farmed on the contour. This practice applies to all cropland. Practice includes seedbed prep and planting of native species. The area of the contour grass strip is taken out of production. This applies to both organic and non-organic.

Before Situation:

The NRCS water erosion prediction software indicates that there is a significant amount of sheet and rill erosion and/or a significant amount of sediment potentially delivered to the downslope edge of the field. A secondary concern is that there may not be enough wildlife/pollinator habitat, food source or refugia in the field or farm.

After Situation:

Introduced grasses and legumes will be established in strips in the field to meet the Contour buffer Strips (332) criteria, resource needs, and producer objectives. Minimum widths shall be based on NRCS local design criteria specific to the purpose for installing the practice. Introduced species shall be selected that do not function as a host for diseases of a field crop and have physical characteristics necessary to control water erosion to tolerable levels in the cropped area of the field.

Feature Measure: Number of acres

Scenario Unit: Acres

Scenario Typical Size: 1.0

Scenario Total Cost: $318.87

Scenario Cost/Unit: $318.87

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	1	$5.34
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	1	$20.31
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$215.46	1	$215.46
Materials						
Nitrogen (N), Urea	71	Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.48	30	$14.40
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.52	20	$10.40
Sulfate of Potash	263	Approved for Organic Systems - Muriate of Potash	Pound	$0.65	20	$13.00
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$9.21	1	$9.21
Introduced Perennial Grasses, Legumes and/or Forbs, Low Density	2747	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$30.75	1	$30.75

Practice: 332 - Contour Buffer Strips

Scenario: #18 - Native, Foregone Income-High Value Cropland

Scenario Description:

Narrow strips of permanent, herbaceous vegetative cover established around the hill slope and alternated down the slope with wider cropped strips in between that are farmed on the contour. This practice applies to all cropland. Practice includes seedbed prep and planting of native species. The area of the contour buffer strips is taken out of production.

Before Situation:

The NRCS water erosion prediction software indicates that there is a significant amount of sheet and rill erosion and/or a significant amount of sediment potentially delivered to the downslope edge of the field. Specialty crops for market are produced on this acreage. A secondary concern is that there may not be enough wildlife/pollinator habitat, food source or refugia in the field or farm.

After Situation:

Native grasses, legumes and forbs will be established in strips in the field to meet the Contour buffer Strips (332) criteria, resource needs, and producer objectives. Minimum widths shall be based on NRCS local design criteria specific to the purpose for installing the practice. Native species shall be selected that do not function as a host for diseases of a field crop and have physical characteristics necessary to control water erosion to tolerable levels in the cropped area of the field.

Feature Measure: number of acres

Scenario Unit: Acres

Scenario Typical Size: 1.0

Scenario Total Cost: $1,370.50

Scenario Cost/Unit: $1,370.50

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	1	$5.34
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	1	$20.31
Foregone Income						
FI, Vegetables	2033	Vegetables is Primary Crop	Acres	$1,224.31	1	$1,224.31
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$9.21	1	$9.21
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$111.33	1	$111.33

Practice: 332 - Contour Buffer Strips

Scenario: #19 - Introduced-High Value Cropland

Scenario Description:

Narrow strips of permanent, herbaceous vegetative cover established around the hill slope and alternated down the slope with wider cropped strips in between that are farmed on the contour. This practice applies to all cropland. Practice includes seedbed prep and planting of mainly introduced species. The area of the field border is taken out of production.

Before Situation:

The NRCS water erosion prediction software indicates that there is a significant amount of sheet and rill erosion and/or a significant amount of sediment potentially delivered to the downslope edge of the field. Specialty crops for market are grown in this field. A secondary concern is that there may not be enough wildlife/pollinator habitat, food source or refugia in the field or farm.

After Situation:

Introduced grasses and legumes will be established in strips in the field to meet the Contour buffer Strips (332) criteria, resource needs, and producer objectives. Minimum widths shall be based on NRCS local design criteria specific to the purpose for installing the practice. Introduced species shall be selected that do not function as a host for diseases of a field crop and have physical characteristics necessary to control water erosion to tolerable levels in the cropped area of the field.

Feature Measure: Number of acres

Scenario Unit: Acres

Scenario Typical Size: 1.0

Scenario Total Cost: $1,327.72

Scenario Cost/Unit: $1,327.72

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	1	$5.34
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	1	$20.31
Foregone Income						
FI, Vegetables	2033	Vegetables is Primary Crop	Acres	$1,224.31	1	$1,224.31
Materials						
Nitrogen (N), Urea	71	Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.48	30	$14.40
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.52	20	$10.40
Sulfate of Potash	263	Approved for Organic Systems - Muriate of Potash	Pound	$0.65	20	$13.00
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$9.21	1	$9.21
Introduced Perennial Grasses, Legumes and/or Forbs, Low Density	2747	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$30.75	1	$30.75

Practice: 332 - Contour Buffer Strips

Scenario: #20 - Wildlife/Pollinator-High Value Cropland

Scenario Description:

Narrow strips of permanent, herbaceous vegetative cover established around the hill slope and alternated down the slope with wider cropped strips in between that are farmed on the contour. This practice applies to all cropland. Practice includes seedbed prep and planting of mainly pollinator friendly species. The area of the field border is taken out of production.

Before Situation:

The NRCS water erosion prediction software indicates that there is a significant amount of sheet and rill erosion and/or a significant amount of sediment potentially delivered to the downslope edge of the field. Specialty crops for market are grown in this field. A secondary concern is that there may not be enough wildlife/pollinator habitat, food source or refugia in the field or farm.

After Situation:

Introduced grasses and legumes will be established in strips in the field to meet the Contour buffer Strips (332) criteria, resource needs, and producer objectives. Minimum widths shall be based on NRCS local design criteria specific to the purpose for installing the practice. Species selected shall meet the wildlife/pollinator habitat requirements of the state and be adapted to the site; not function as a host for diseases of a field crop and; have physical characteristics necessary to control sheet and rill erosion to tolerable levels on the cropped area of the field.

Feature Measure: Number of acres

Scenario Unit: Acres

Scenario Typical Size: 1.0

Scenario Total Cost: $1,370.50

Scenario Cost/Unit: $1,370.50

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	1	$5.34
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	1	$20.31
Foregone Income						
FI, Vegetables	2033	Vegetables is Primary Crop	Acres	$1,224.31	1	$1,224.31
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$9.21	1	$9.21
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$111.33	1	$111.33

Practice: 333 - Amending Soil Properties with Gypsum Products

Scenario: #1 - Gypsum greater than 1 ton rate

Scenario Description:

Gypsum application of more than one ton/acre rate (typical average 1.5 tons/acre) to improve surface water quality due to phosphorus, pathogens, and soil health (Ca/Mg ratio). Scenario to be used in combination with an implemented nutrient management plan. The producer will use gypsum to improve soil surface structure and reduce concentration of dissolved reactive phosphorus (DRP) in runoff. Scenario includes the cost of material, application, and supervisor/management time to establish and manage new application methodology, including rates, timing, and sequence of application with other nutrient materials (i.e., manures, bio-solids, and fertilizers). The addressed resource concern is water quality and soil health. Associated practices are Nutrient Management (590), Conservation Crop Rotation (328), Cover Crop (340), Residue and Tillage Management, No-till (329) and Residue and Tillage Management, Reduced Till (345).

Before Situation:

Cropland in continuous production having relatively low soil organic matter and moderately high clay content with application of manure with a risk of pathogens. Soil in these fields has poor soil structure and a high risk of phosphorus and pathogen runoff. The soils are susceptible to soil crusting and as a result of long term tillage systems have a high concentration of phosphorous near the soil surface. The combination of poor soil structure and high nutrient levels at the soil surface results in runoff events with high concentrations of DRP that may contribute to degraded water quality.

After Situation:

A determination based on existing soil samples used in normal nutrient management has been made. The Implementation Requirements for Amending Soil Properties with Gypsum (333) has been developed for the site. The application of gypsum to the field based on the existing soil samples will result in reduced runoff and improved runoff water quality. This condition over time in combination with an implemented nutrient management plan and supporting practices to improve soil health will improve surface water quality.

Feature Measure: Acres with a gypsum product applic

Scenario Unit: Acres

Scenario Typical Size: 40.0

Scenario Total Cost: $2,675.54

Scenario Cost/Unit: $66.89

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Lime application	953	Lime application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.57	40	$302.80
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	1	$45.34
Materials						
Gypsum, Ground Ag Grade, Bulk	1224	Agricultural grade quarry ground gypsum (CaCO4) for dispersive soil treatment. Materials and delivery only.	Ton	$38.79	60	$2,327.40

Practice: 333 - Amending Soil Properties with Gypsum Products

Scenario: #2 - Gypsum less than 1 ton per acre

Scenario Description:

Gypsum application of less than or equal to one ton/acre rate (typical average 1 tons/acre) to improve surface water quality due to phosphorus, pathogens, and soil health (Ca/Mg ratio). Scenario to be used in combination with an implemented nutrient management plan. The producer will use gypsum to improve soil surface structure and reduce concentration of dissolved reactive phosphorus (DRP) in runoff. Scenario includes the cost of material, application, and management time to establish and manage new application methodology, including rates, timing, and sequence of application with other nutrient materials (i.e., manures, bio-solids, and fertilizers). . The addressed resource concern is water quality and soil health. Associated practices are Nutrient Management (590), Conservation Crop Rotation (328), Cover Crop (340), Residue and Tillage Management, No-till (329) and Residue and Tillage Management, Reduced Till (345).

Before Situation:

Cropland in continuous production having relatively low soil organic matter and moderately high clay content. Soil in these fields have poor soil structure and a high risk of phosphorus and pathogen runoff. The soils are susceptible to soil crusting and as a result of long term tillage systems have high concentration of phosphorous near the soil surface. The combination of poor soil structure and high nutrient levels at the soil surface results in runoff events with high concentrations of DRP that may contribute to degraded water quality.

After Situation:

A determination based on existing soil samples used in normal nutrient management has been made. The Implementation Requirements for Amending Soil Properties with Gypsum (333) has been developed for the site. The application of gypsum to the field is based on the existing soil samples and will result in reduce runoff and improve runoff water quality. This condition over time in combination with the implemented nutrient management plan and supporting practices to improve soil health will improve surface water quality.

Feature Measure: Acres with a gypsum product applic

Scenario Unit: Acres

Scenario Typical Size: 40.0

Scenario Total Cost: $1,511.84

Scenario Cost/Unit: $37.80

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Lime application	953	Lime application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.57	40	$302.80
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	1	$45.34
Materials						
Gypsum, Ground Ag Grade, Bulk	1224	Agricultural grade quarry ground gypsum (CaCO4) for dispersive soil treatment. Materials and delivery only.	Ton	$38.79	30	$1,163.70

Practice: 334 - Controlled Traffic Farming

Scenario: #1 - Controlled Traffic

Scenario Description:

This practice must be part of a conservation management system to reduce soil compaction. This scenario considers the time needed to modify equipment, develop the technical skills necessary to effectively implement a controlled traffic farming system on a typical 200 acre cropland farm. The controlled traffic generally utilizes RTK automatic steering technology to locate and maintain high load field traffic. This scenario represents the costs associated with reducing the amount of surface area tracked/compacted to 33% or less. Cost represents typical situations for conventional, organic, and transitioning to organic producers.

Before Situation:

The typical scenario for this practice is a 200 acre row crop operation on high clay, poorly drained soils. Studies show that when high wheel load traffic is not controlled, up to 85% of the field is tracked causing some degree of soil compaction. Before the practice is installed traffic is uncontrolled tracking and 85% of the field has compacted soil which limits soil health.

After Situation:

An Implementation Requirement for Controlled Traffic (334) is developed and the controlled traffic lanes installed per the implementation requirements. After the practice is installed wheel/track traffic is confined to designated traffic lanes/tramlines. Wheel/track soil compaction is confined to the traffic lanes to protect the remaining surface area and subsoil from wheel/track compaction. The wheel/track traffic follows the installed traffic lanes/tramlines each year.

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 200.0

Scenario Total Cost: $11,626.40

Scenario Cost/Unit: $58.13

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	80	$2,729.60
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	80	$8,896.80

Practice: 338 - Prescribed Burning

Scenario: #1 - Understory Burn

Scenario Description:

Applying a prescribed burn according to designed burn plan and NRCS Prescribed Burning (338) standard and specifications. An Understory burn can consume debris or leaf litter under controlled conditions that otherwise could burn uncontrollably and devastatingly. Prior to burning unit may need to be treated to reduce slash height and quantities. Burn should be cool enough to not cause mortality to residual stand but also must reduce litter and debris. Burned firebreaks used to achieve total firebreak width are part of these burns. (Constructed firebreak cost is not included in cost of burn. Refer to Firebreak (394) standard and cost scenarios)

Before Situation:

Light slash accumulation in a open forest stand. Leaf litter and debris throughout stand. Small seedlings of various quantities may be present.

After Situation:

Litter, debris and slash are consumed, small seedlings may be killed during active burning. Residual larger trees have little to no scorching. Post treatment fire danger is significantly reduced.

Feature Measure: Acres planned

Scenario Unit: Acres

Scenario Typical Size: 320.0

Scenario Total Cost: $3,454.78

Scenario Cost/Unit: $10.80

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	8	$178.32
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$19.49	16	$311.84
Trailer, water tank	1598	Mobile 5,000 gal water tank mounted on a trailer. Equipment only. Does not include towing equipment.	Hours	$19.31	8	$154.48
Water tank, portable	1602	Portable water tank transported in a pick up truck. Typically with 200 gallon capacity includes tank with pump, hose and sprayer. Does not include the pickup truck. Equipment only.	Hours	$12.92	8	$103.36
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	32	$1,091.84
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	12	$544.08
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	8	$889.68
Materials						
Fuel, ignition fuel mixture	1596	Mixture of gasoline and diesel for ignition of prescribed burns. Materials only.	Gallons	$2.55	20	$51.00
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	2	$130.18

Practice: 338 - Prescribed Burning

Scenario: #2 - Level Terrain, Herbaceous Fuel Non-Volatile

Scenario Description:

Applying a prescribed burn according to designed burn plan and NRCS Prescribed Burning (338) standard and specifications in order to control undesirable species, improve wildlife habitat, improve plant productivity and/or quality, facilitate grazing distribution and maintain ecological processes. This scenario is based on a burn area of less than 320 acres and applies under the following conditions: where the terrain of the majority of the area to be burned <15% slopes with herbaceous and/or low volatile woody fuel with no high volatile fuels. Burned firebreaks used to achieve total firebreak width are part of these burns. (Constructed firebreak cost is not included in cost of burn. Refer to Firebreak (394) standard and cost scenarios)

Before Situation:

Desirable plant composition is lacking due to reduced plant vigor, invasive species or improper livestock distribution.

After Situation:

Desirable plant composition is restored, plant vigor improved and invasive species reduced. Forage production and quality for livestock and /or wildlife is improved.

Feature Measure: Acres planned

Scenario Unit: Acres

Scenario Typical Size: 320.0

Scenario Total Cost: $2,956.03

Scenario Cost/Unit: $9.24

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$109.25	1	$109.25
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	16	$356.64
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$19.49	16	$311.84
Trailer, water tank	1598	Mobile 5,000 gal water tank mounted on a trailer. Equipment only. Does not include towing equipment.	Hours	$19.31	8	$154.48
Water tank, portable	1602	Portable water tank transported in a pick up truck. Typically with 200 gallon capacity includes tank with pump, hose and sprayer. Does not include the pickup truck. Equipment only.	Hours	$12.92	16	$206.72
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	32	$1,091.84
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	12	$544.08
Materials						
Fuel, ignition fuel mixture	1596	Mixture of gasoline and diesel for ignition of prescribed burns. Materials only.	Gallons	$2.55	20	$51.00
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	2	$130.18

Practice: 338 - Prescribed Burning

Scenario: #3 - Level Terrain, Volatile or woody fuels

Scenario Description:

Applying a prescribed burn according to designed burn plan and NRCS Prescribed Burning (338) standard and specifications in order to control undesirable species, improve wildlife habitat, improve plant productivity and/or quality, facilitate grazing distribution and maintain ecological processes. This scenario is based on a burn area of less than 320 acres and applies under the following conditions: where the terrain of the majority of the area to be burned <15% slopes with herbaceous and low volatile woody fuel with high volatile woody fuels less than 4ft tall. Burned firebreaks used to achieve total firebreak width are part of these burns. (Constructed firebreak cost is not included in cost of burn. Refer to Firebreak (394) standard and cost scenarios)

Before Situation:

Desirable plant composition is lacking due to reduced plant vigor, invasive species or improper livestock distribution.

After Situation:

Desirable plant composition is restored, plant vigor improved and invasive species reduced. Forage production and quality for livestock and /or wildlife is improved.

Feature Measure: Acres planned

Scenario Unit: Acres

Scenario Typical Size: 320.0

Scenario Total Cost: $4,060.62

Scenario Cost/Unit: $12.69

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$109.25	1	$109.25
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	16	$356.64
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$19.49	16	$311.84
Trailer, water tank	1598	Mobile 5,000 gal water tank mounted on a trailer. Equipment only. Does not include towing equipment.	Hours	$19.31	8	$154.48
Water tank, portable	1602	Portable water tank transported in a pick up truck. Typically with 200 gallon capacity includes tank with pump, hose and sprayer. Does not include the pickup truck. Equipment only.	Hours	$12.92	16	$206.72
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	64	$2,183.68
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	12	$544.08
Materials						
Fuel, ignition fuel mixture	1596	Mixture of gasoline and diesel for ignition of prescribed burns. Materials only.	Gallons	$2.55	25	$63.75
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	2	$130.18

Practice: 338 - Prescribed Burning

Scenario: #4 - Steep Terrain, Herbaceous Fuel

Scenario Description:

Applying a prescribed burn according to designed burn plan and NRCS Prescribed Burning (338) standard and specifications in order to control undesirable species, improve wildlife habitat, improve plant productivity and/or quality, facilitate grazing distribution and maintain ecological processes. This scenario is based on a burn area 320 acres and applies under the following conditions: where the terrain of the majority of the area to be burned >15% slopes with herbaceous and/or low volatile woody fuel with no high volatile fuels. Burned firebreaks used to achieve total firebreak width are part of these burns. (Constructed firebreak cost is not included in cost of burn. Refer to Firebreak (394) standard and cost scenarios)

Before Situation:

Desirable plant composition is lacking due to reduced plant vigor, invasive species or improper livestock distribution.

After Situation:

Desirable plant composition is restored, plant vigor improved and invasive species reduced. Forage production and quality for livestock and /or wildlife is improved.

Feature Measure: Acres planned

Scenario Unit: Acres

Scenario Typical Size: 320.0

Scenario Total Cost: $5,232.04

Scenario Cost/Unit: $16.35

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$109.25	1	$109.25
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	16	$356.64
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$19.49	24	$467.76
Trailer, water tank	1598	Mobile 5,000 gal water tank mounted on a trailer. Equipment only. Does not include towing equipment.	Hours	$19.31	8	$154.48
Water tank, portable	1602	Portable water tank transported in a pick up truck. Typically with 200 gallon capacity includes tank with pump, hose and sprayer. Does not include the pickup truck. Equipment only.	Hours	$12.92	16	$206.72
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	64	$2,183.68
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	24	$1,088.16
Materials						
Fuel, ignition fuel mixture	1596	Mixture of gasoline and diesel for ignition of prescribed burns. Materials only.	Gallons	$2.55	25	$63.75
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	2	$130.18
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 338 - Prescribed Burning

Scenario: #5 - Steep Terrain, Volatile or Woody fuels

Scenario Description:

Applying a prescribed burn according to designed burn plan and NRCS Prescribed Burning (338) standard and specifications in order to control undesirable species, improve wildlife habitat, improve plant productivity and/or quality, facilitate grazing distribution and maintain ecological processes. This scenario is based on a burn area of 320 acres and applies under the following conditions: where the terrain of the majority of the area to be burned >15% slopes with herbaceous and low volatile woody fuel with high volatile woody fuels greater than 4ft tall, but fire is still a ground fire carried by fine fuel. Burned firebreaks used to achieve total firebreak width are part of these burns. (Constructed firebreak cost is not included in cost of burn. Refer to Firebreak (394) standard and cost scenarios)

Before Situation:

Desirable plant composition is lacking due to reduced plant vigor, invasive species or improper livestock distribution.

After Situation:

Desirable plant composition is restored, plant vigor improved and invasive species reduced. Forage production and quality for livestock and /or wildlife is improved.

Feature Measure: Acres planned

Scenario Unit: Acres

Scenario Typical Size: 320.0

Scenario Total Cost: $6,258.47

Scenario Cost/Unit: $19.56

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$109.25	1	$109.25
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	16	$356.64
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$19.49	48	$935.52
Trailer, water tank	1598	Mobile 5,000 gal water tank mounted on a trailer. Equipment only. Does not include towing equipment.	Hours	$19.31	8	$154.48
Water tank, portable	1602	Portable water tank transported in a pick up truck. Typically with 200 gallon capacity includes tank with pump, hose and sprayer. Does not include the pickup truck. Equipment only.	Hours	$12.92	16	$206.72
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	80	$2,729.60
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	24	$1,088.16
Materials						
Fuel, ignition fuel mixture	1596	Mixture of gasoline and diesel for ignition of prescribed burns. Materials only.	Gallons	$2.55	30	$76.50
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	2	$130.18
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 338 - Prescribed Burning

Scenario: #56 - Pinyon and Juniper Single Tree Burning

Scenario Description:

Applying a prescribed burn according to designed burn plan and NRCS Prescribed Burning (338) standard and specifications in order to control undesirable species, improve wildlife habitat, improve plant productivity and/or quality, facilitate grazing distribution and maintain ecological processes. This scenario is based on a burn area of less than 320 acres and applies under the following conditions: where the target species (typically pinyon and juniper) is spaced widely, understory fuel is lacking, or conditions for broadcast burning are outside of safe ranges. Individual trees are ignited and burned, as an alternative to a lop and scatter treatment in Brush Management (314).

Before Situation:

Desirable plant composition is lacking due to reduced plant vigor, invasive species or improper livestock distribution.

After Situation:

Desirable plant composition is restored, plant vigor improved and invasive species reduced. Forage production and quality for livestock and /or wildlife is improved.

Feature Measure: Acres planned

Scenario Unit: Acres

Scenario Typical Size: 320.0

Scenario Total Cost: $6,444.87

Scenario Cost/Unit: $20.14

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$109.25	1	$109.25
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	16	$356.64
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$19.49	16	$311.84
Trailer, water tank	1598	Mobile 5,000 gal water tank mounted on a trailer. Equipment only. Does not include towing equipment.	Hours	$19.31	8	$154.48
Water tank, portable	1602	Portable water tank transported in a pick up truck. Typically with 200 gallon capacity includes tank with pump, hose and sprayer. Does not include the pickup truck. Equipment only.	Hours	$12.92	16	$206.72
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	64	$2,183.68
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	12	$544.08
Materials						
Fuel, ignition fuel mixture	1596	Mixture of gasoline and diesel for ignition of prescribed burns. Materials only.	Gallons	$2.55	960	$2,448.00
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	2	$130.18

Practice: 338 - Prescribed Burning

Scenario: #73 - Pile or Windrow Burning

Scenario Description:

Large debris (typically pinyon and juniper) piles located in the wildland/urban interface, burning typically during the winter with some snow cover or wet fuels in the area. This assumes a 60 acre project that would be treated in 2 12 hour days.

Before Situation:

Large debris piles typically resulting from land clearing or brush management that provide perching sites for raptors in sage grouse habitat, obstruct vision and travel, hinder normal ranching operations, and prevent plant establishment on a significant portion of the area. Resource concerns include wildlife habitat, plant community health, and livestock production limitations.

After Situation:

Debris piles are removed improving sage grouse habitat, allowing space for plant community establishment, and normal use for grazing.

Feature Measure: acres cleared and woody material

Scenario Unit: Acres

Scenario Typical Size: 60.0

Scenario Total Cost: $18,766.56

Scenario Cost/Unit: $312.78

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	96	$2,139.84
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$19.49	96	$1,871.04
Water tank, portable	1602	Portable water tank transported in a pick up truck. Typically with 200 gallon capacity includes tank with pump, hose and sprayer. Does not include the pickup truck. Equipment only.	Hours	$12.92	72	$930.24
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	288	$9,826.56
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	72	$3,264.48
Materials						
Fuel, ignition fuel mixture	1596	Mixture of gasoline and diesel for ignition of prescribed burns. Materials only.	Gallons	$2.55	288	$734.40

Practice: 340 - Cover Crop

Scenario: #1 - Cover Crop - Basic (Organic and Non-organic)

Scenario Description:

Typically a small grain or legume (may also use forage sorghum, radishes, turnips, buckwheat, etc.) will be planted as a cover crop immediately after harvest of a row crop, and will be followed by a row crop that will utilize the residue as a mulch. This scenario assumes that seed will be planted with a drill. The cover crop should be allowed to generate as much biomass as possible, without delaying planting of the following crop. The cover crop will be terminated using an approved herbicide prior to planting the subsequent crop.

Before Situation:

Row crops such as corn, soybeans, or cotton are grown and harvested in mid-late fall. Fields are disked immediately following harvest, with rows in some fields being hipped for drainage. Residue amounts after harvest average 30% or less, resulting in bare soil being exposed to wind erosion and/or intense rainfall during the fall, winter, and early spring. Over the winter residue degrades and sediment/nutrient runoff from fields increases. Erosion exceeds soil loss tolerances. Runoff from the fields flows into streams, water courses or other water bodies causing degradation to the receiving waters. Soil health (soil organic matter) declines over time as a result of tillage practices, low residue crops, and long periods of bare soil.

After Situation:

Implementation Requirements according to Cover Crop (340) are prepared and implemented. Within 30 days after harvest of the row crop, fields are planted with a small grain or legume cover crop (may also use forage sorghum, radishes, turnips, buckwheat, etc.), typically rye or clover. The average field size is 40 acres. The cover crop is seeded with a drill. No additional fertilizer is applied with the cover crop. The cover crop provides soil cover by late fall, throughout the winter, and into the early spring. Runoff and erosion are reduced. Wind erosion is reduced by standing residues. The cover crop is terminated with an approved herbicide prior to spring planting as late as feasible to maximize plant biomass production. Over time, soil health is improved due to the additional biomass, ground cover, soil infiltration, and plant diversity introduced to the cropping system. Cover crop residues left on the surface may maximize weed control by increasing allelopathic and mulching effect.

Feature Measure: Area planted

Scenario Unit: Acres

Scenario Typical Size: 40.0

Scenario Total Cost: $2,697.60

Scenario Cost/Unit: $67.44

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	40	$213.60
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	40	$812.40
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$9.21	40	$368.40
Annual Grasses	2730	Annual grasses, one or more species, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$32.58	40	$1,303.20

Practice: 340 - Cover Crop

Scenario: #6 - Cover Crop - Adaptive Management

Scenario Description:

The practice scenario is for the implementation of cover crops in small replicated plots to allow the producer to learn how to manage cover crops on their operation. Scenario includes implementing replicated strip trials on a field plot to evaluate, identify and implement a particular cover crop management strategy (e.g., cover crop vs no cover crop, multiple species vs, single species, evaluate different termination methods or timings, using a legume vs no legume for nitrogen credits). This will be done following the guidance in the NRCS Technical Note 10 - Adaptive Management.

Before Situation:

Row crops such as corn, soybeans, or cotton are grown and harvested in mid-late fall. Fields are disked immediately following harvest, with rows in some fields being hipped for drainage. Residue amounts after harvest average 30% or less, resulting in bare soil being exposed to wind erosion and/or intense rainfall. Over the winter residue degrades and sediment/nutrient runoff from fields increases. Sheet and rill erosion occurs with visible rills by spring. Runoff from the fields flows into streams, water courses or other water bodies causing degradation to the receiving waters. Soil health (soil organic matter) declines over time as a result of tillage practices, low residue crops, and long periods of bare soil. The producer is considering the use of cover crops but is unsure how to manage on their unique operation or is seeking a way to better manage cover crops in the operation.

After Situation:

Implementation Requirements for Cover Crop (340) will be prepared along with the Adaptive Management plan for the replicated cover crop plots and implemented. Installation of this scenario will result in establishment of a cover crop replicated plots to compare to different management strategies for cover crop management following the guidance in the Agronomy Technical Note 10 - Adaptive Management. Implementation involves establishing the replicated plots to evaluate one or more cover crop management strategies. The plot will consist of at least 4 replicated plots designed, laid out, managed and evaluated with the assistance of a consultant knowledgeable in cover crop management. Results are used to make cover crop management decisions to address erosion and water quality issues. Yields will be measured and statistically summarized following the procedures in Agronomy Technical Note 10 - Adaptive Management. The yields for each plot will be adjusted to the appropriate moisture content. This would be repeated for 3 years.

Feature Measure: Based on 10 acres

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $2,478.10

Scenario Cost/Unit: $2,478.10

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	10	$53.40
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	10	$203.10
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	20	$682.40
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	40	$967.60
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$9.21	10	$92.10
Annual Grasses, Legumes or Forbs	2732	A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$47.95	10	$479.50

Practice: 340 - Cover Crop

Scenario: #11 - Cover Crop - Multiple Species (Organic and Non-organic)

Scenario Description:

Typically the multi-species cover crop (two or more species) mix includes a small grain, a legume, and may include other species such as forage sorghum, radishes, turnips, buckwheat, etc.). This mix will address all the purposes of the Cover Crop (340) standard. Typically the cover crop is seeded immediately after harvest of a row crop, but may be inter-seeded into a row crop using a broadcast seeder, drill, or similar device. The cover crop will be followed by another row crop and will utilize the residue as a mulch. The cover crop should be allowed to generate as much biomass as possible without delaying planting of the following crop. The cover crop will be terminated using an approved herbicide or tillage prior to planting the subsequent crop and terminated per the NRCS Cover Crop Termination Guidelines.

Before Situation:

Row crops such as corn, soybeans, or cotton are grown and harvested in mid-late fall. Fields are disked immediately following harvest with rows in some fields being hipped for drainage. Residue amounts after harvest average 30% or less resulting in bare soil being exposed to wind erosion and/or intense rainfall during the fall, winter, and early spring. Over the winter residue degrades and sediment/nutrient runoff from fields increases. Erosion exceeds soil loss tolerances. Runoff from the fields flows into streams, water courses or other water bodies causing degradation to the receiving waters. Soil health (soil organic matter) declines over time as a result of tillage practices, low residue crops, and long periods of bare soil.

After Situation:

Implementation Requirements according to Cover Crop (340) are prepared and implemented. Within 30 days after the harvest of row crop, fields are planted with a multi-species (2 or more species) cover crop mix that generally includes a small grain, a legume, and may include other species such as forage sorghum, radishes, turnips, buckwheat, etc. The average field size is 40 acres. The cover crop is seeded with a drill, broadcast seeder, aerial broadcast, or other method. No additional fertilizer is applied with the cover crop. The cover crop provides soil cover by late fall, throughout the winter, and into the early spring. Runoff and erosion are reduced. Wind erosion is reduced by standing residues. The cover crop is terminated with an approved herbicide prior to spring planting as late as feasible to maximize plant biomass production. Over time, soil health is improved due to the additional biomass, ground cover, soil infiltration, and plant diversity introduced to the cropping system. Cover crop residues left on the surface may maximize weed control by increasing allelopathic and mulching effect.

Feature Measure: Area planted

Scenario Unit: Acres

Scenario Typical Size: 40.0

Scenario Total Cost: $3,312.40

Scenario Cost/Unit: $82.81

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	40	$213.60
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	40	$812.40
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$9.21	40	$368.40
Annual Grasses, Legumes or Forbs	2732	A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$47.95	40	$1,918.00

Practice: 340 - Cover Crop

Scenario: #21 - Cover Crop- Basic, Organic/Non-Organic, Winter Kill

Scenario Description:

Typically a small grain or legume (may also use forage sorghum, radishes, turnips, buckwheat, etc.) will be planted as a cover crop immediately after harvest of a row crop, and will be followed by a row crop that will utilize the residue as a mulch. This scenario assumes that seed will be planted with a drill. The cover crop should be allowed to generate as much biomass as possible, without delaying planting of the following crop. The cover crop will be killed over the winter without the use of herbicide or mechanically killed.

Before Situation:

Row crops such as corn, soybeans, or cotton are grown and harvested in mid-late fall. Fields are disked immediately following harvest, with rows in some fields being hipped for drainage. Residue amounts after harvest average 30% or less, resulting in bare soil being exposed to wind erosion and/or intense rainfall during the fall, winter, and early spring. Over the winter residue degrades and sediment/nutrient runoff from fields increases. Erosion exceeds soil loss tolerances. Runoff from the fields flows into streams, water courses or other water bodies causing degradation to the receiving waters. Soil health (soil organic matter) declines over time as a result of tillage practices, low residue crops, and long periods of bare soil.

After Situation:

Implementation Requirements according to Cover Crop (340) are prepared and implemented. Within 30 days after harvest of the row crop, fields are planted with a small grain or legume cover crop (may also use forage sorghum, radishes, turnips, buckwheat, etc.), typically rye or clover. The average field size is 40 acres. The cover crop is seeded with a drill. No additional fertilizer is applied with the cover crop. The cover crop provides soil cover by late fall, throughout the winter, and into the early spring. Runoff and erosion are reduced. Wind erosion is reduced by standing residues. The cover crop is terminated over the winter and is planted early enough to maximize plant biomass production before the winter kill. Over time, soil health is improved due to the additional biomass, ground cover, soil infiltration, and plant diversity introduced to the cropping system. Cover crop residues left on the surface may maximize weed control by increasing allelopathic and mulching effect.

Feature Measure: Area planted

Scenario Unit: Acres

Scenario Typical Size: 40.0

Scenario Total Cost: $2,115.60

Scenario Cost/Unit: $52.89

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	40	$812.40
Materials						
Annual Grasses	2730	Annual grasses, one or more species, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$32.58	40	$1,303.20

Practice: 340 - Cover Crop

Scenario: #38 - Cover Crop - Basic Organic

Scenario Description:

"Typically a small grain or small grain-legume mix (may also use forage sorghum, radishes, turnips, buckwheat, etc) will be planted as a cover crop immediately after harvest of an organically grown crop, and will be followed by an organically grown crop that will utilize the residue as a mulch. This scenario assumes that seed will be planted with a no-till drill. The cover crop should be allowed to generate as much biomass as possible, without delaying planting of the following crop. The cover crop will be terminated using a mechnical kill method (mowing, rolling, undercutting, etc.), within weeks prior to planting the subsequent crop. This scenario REQUIRES use of Certified Organic Seed. Associated practices: Conservation Cover (327), Conservation Crop Rotation (328), Residue and Tillage Management, No-Till/Strip Till/Direct Seed (329), Critical Area Planting (342), Residue Management, Seasonal (344), Residue and Tillage Management, Mulch Till (345), Residue and Tillage Management, Ridge Till (346), Nutrient Management (590), Integrated Pest Management (595)."

Before Situation:

Organically grown crops such as various vegetable and fruit crops (along with organically produced row crops) are grown and harvested in mid-late fall. Fields are disked immediately following harvest. Residue amounts after harvest average 30% or less, resulting in bare soil being exposed to wind erosion and/or intense rainfall during the fall, winter, and early spring. Over the winter residue degrades and sediment/nutrient runoff from fields increases. Sheet and rill erosion occurs with visible rills by spring. Runoff from the fields flows into streams, water courses or other water bodies causing degradation to the receiving waters. Soil health (soil organic matter) declines over time as a result of tillage practices, low residue crops, and long periods of bare soil.

After Situation:

Within 30 days after harvest of organic crop, fields are planted with a small grain-legume mix cover crop, typically rye and clover. The average field size is 25 acres. The cover crop is seeded with a no-till drill. No additional fertilizer is applied with the cover crop. The cover crop provides soil cover by late fall, throughout the winter, and into the early spring. Runoff and erosion are reduced and no rills are visible on the soil surface in the spring. The cover crop is terminated with using a mechnical kill method (mowing, rolling, undercutting, etc.), prior to spring planting as late as feasible to maximize plant biomass production. Over time, soil health is improved due to the additional biomass, ground cover, and plant diversity introduced to the cropping system. Wind erosion is reduced by standing resides. Cover crop residues left on the surface may maximize weed control by increasing allelopathic and mulching effect.

Feature Measure: Area Planted

Scenario Unit: Acres

Scenario Typical Size: 30.0

Scenario Total Cost: $3,232.50

Scenario Cost/Unit: $107.75

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Mechanical weed control, Vegetation termination	957	Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs.	Acres	$18.86	30	$565.80
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	30	$609.30
Materials						
Certified Organic, Annual Grasses, Legumes and/or Forbs	2343	Annual grasses, mostly introduced but may be native. Used for temporary cover or cover crops. Certified organic. Includes material and shipping only.	Acres	$68.58	30	$2,057.40

Practice: 340 - Cover Crop

Scenario: #54 - Cover Crop - 1 acre or less

Scenario Description:

Typically a small grain or legume will be planted as a cover crop immediately after harvest of a crop, and will be followed by a crop. This scenario assumes that seed will be planted by hand. The cover crop should be allowed to generate as much biomass as possible, without delaying planting of the following crop. The cover crop will typically be terminated by mowing or tilling prior to planting the subsequent crop.

Before Situation:

Crops such as sweet corn, vegetables, or root crops are grown and harvested in mid-late fall. Fields are disked immediately following harvest, with rows in some fields being hipped for drainage. Residue amounts after harvest average 30% or less, resulting in bare soil being exposed to wind erosion and/or intense rainfall during the fall, winter, and early spring. Over the winter residue degrades and sediment/nutrient runoff from fields increases. Erosion exceeds soil loss tolerances. Runoff from the fields flows into streams, water courses or other water bodies causing degradation to the receiving waters. Soil health (soil organic matter) declines over time as a result of tillage practices, low residue crops, and long periods of bare soil.

After Situation:

Implementation Requirements according to Cover Crop (340) are prepared and implemented. Within 10 days after harvest of the crop, fields are planted with a small grain or legume cover crop, typically rye or clover. The average field size is 0.25 acres. The cover crop is seeded by hand. No additional fertilizer is applied with the cover crop. The cover crop provides soil cover by late fall, throughout the winter, and into the early spring. Runoff and erosion are reduced. Wind erosion is reduced by standing residues. The cover crop is terminated with an approved herbicide prior to spring planting as late as feasible to maximize plant biomass production. Over time, soil health is improved due to the additional biomass, ground cover, soil infiltration, and plant diversity introduced to the cropping system. Cover crop residues left on the surface may maximize weed control by increasing allelopathic and mulching effect.

Feature Measure: area planted

Scenario Unit: Acres

Scenario Typical Size: 0.3

Scenario Total Cost: $78.64

Scenario Cost/Unit: $314.55

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Walk-behind Rototiller	2723	8 hp walk-behind rototiller, one-day rental	Day	$169.84	0.25	$42.46
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	1	$24.19
Materials						
Annual Grasses, Legumes or Forbs	2732	A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$47.95	0.25	$11.99

Practice: 342 - Critical Area Planting

Scenario: #1 - Native or Introduced Vegetation - Normal Tillage (Organic and Non-Organic)

Scenario Description:

Establishment of permanent vegetation (Native and Introduced) on a site (both organic and non-organic) that is void or nearly void of vegetation due to a natural occurrence or a newly constructed conservation practice. Costs include seedbed preparation with typical tillage implements, grass/legume seed, companion crop, and fertilizer and lime with application.

Before Situation:

Areas that are void or nearly void of vegetation, resulting in bare soil being exposed to erosive processes. The exposed areas may be caused from recent natural occurrences (fire, flood, wind, etc.) or due to newly constructed conservation practices such as waterways, terraces, water and sediment basins or dams. The exposed areas will be subject to wind and water erosion that exceed soil loss tolerances. Runoff from the area flows into streams, water courses or other water bodies causing degradation to the receiving waters. The soil typically has a pH imbalance and low fertility.

After Situation:

Implementation Requirements are prepared and implemented according to the Critical Area Planting (342) standard. This typical 1.0 acre critical area is stabilized by applying fertilizer, lime and seed. Soil amendments will be incorporated at a depth of four to six inches to improve fertility and ensure establishment of permanent vegetative cover. The site will be stabilized, erosion reduced, and offsite damages reduced/eliminated.

Feature Measure: area seeded

Scenario Unit: Acres

Scenario Typical Size: 1.0

Scenario Total Cost: $278.07

Scenario Cost/Unit: $278.07

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	2	$19.78
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.12	1	$6.12
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	1	$20.31
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acres	$8.00	1	$8.00
Materials						
Nitrogen (N), Urea	71	Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.48	30	$14.40
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.52	60	$31.20
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.35	60	$21.00
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$50.08	2	$100.16
Introduced Perennial Grasses, Legumes and/or Forbs, High Density	2749	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Includes material and shipping.	Acres	$57.10	1	$57.10

Practice: 342 - Critical Area Planting

Scenario: #4 - Native or Introduced Vegetation - Moderate Grading (Organic and Non-Organic)

Scenario Description:

Establishment of permanent vegetation (native and introduced) on a site that is void or nearly void of vegetation due to a natural or human disturbance. Costs include a dozer for grading and shaping of small gullies, seedbed preparation with typical tillage implements, grass/legume seed, companion crop, and fertilizer and lime with application.

Before Situation:

Areas that are void or nearly void of vegetation, resulting in bare soil being exposed to erosive processes. The exposed areas may be caused from natural occurrences (fire, flood, etc.) or human disturbance. The exposed areas have visible rills and small gullies averaging 1 foot in depth and 1 foot in width that requires some moderate grading to prepare a seedbed. Runoff from the area flows into streams, water courses or other water bodies causing degradation to the receiving waters. The soil typically has a pH imbalance and low fertility.

After Situation:

Implementation Requirements are prepared and implemented according to the Critical Area Planting (342) standard.. This typical 1.0 acre critical area is stabilized by grading and shaping the small gullies with a dozer and then applying fertilizer, lime and seed. The site will be stabilized, erosion reduced, and offsite damages reduced/eliminated.

Feature Measure: area seeded

Scenario Unit: Acres

Scenario Typical Size: 1.0

Scenario Total Cost: $591.67

Scenario Cost/Unit: $591.67

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.89	4	$203.56
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	2	$19.78
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.12	1	$6.12
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	1	$20.31
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acres	$8.00	1	$8.00
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	4	$134.56
Materials						
Nitrogen (N), Urea	71	Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.48	30	$14.40
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.52	60	$31.20
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.35	60	$21.00
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$50.08	2	$100.16
Annual Grasses	2730	Annual grasses, one or more species, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$32.58	1	$32.58

Practice: 342 - Critical Area Planting

Scenario: #6 - Native or Introduced Vegetation - Heavy Grading (Organic and Non-Organic)

Scenario Description:

Establishment of permanent vegetation on a site that is void or nearly void of vegetation due to a natural or human disturbance. Costs include a dozer for grading and shaping of moderate to severe gullies, seedbed preparation with typical tillage implements, grass/legume seed, companion crop, and fertilizer and lime with application.

Before Situation:

Areas that are void or nearly void of vegetation, resulting in bare soil being exposed to erosive processes. The exposed areas may be caused from natural occurrences (fire, flood, etc.) or human disturbance. The exposed areas have visible rills and moderate to severe gullies averaging 3 feet in depth and 3 feet in width. Runoff from the area flows into streams, water courses or other water bodies causing degradation to the receiving waters. The soil typically has a pH imbalance and low fertility.

After Situation:

Implementation Requirements are prepared and implemented according to the Critical Area Planting (342) standard. This typical 1.0 acre critical area is stabilized by grading and shaping the moderate to severe gullies with a dozer and then applying fertilizer, lime and seed. The site will be stabilized, erosion reduced, and offsite damages reduced/eliminated.

Feature Measure: area seeded

Scenario Unit: Acres

Scenario Typical Size: 1.0

Scenario Total Cost: $945.16

Scenario Cost/Unit: $945.16

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.89	8	$407.12
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	2	$19.78
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.12	1	$6.12
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	1	$20.31
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acres	$8.00	1	$8.00
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	8	$269.12
Materials						
Nitrogen (N), Urea	71	Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.48	30	$14.40
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.52	60	$31.20
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.35	60	$21.00
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$50.08	2	$100.16
Annual Grasses, Legumes or Forbs	2732	A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$47.95	1	$47.95

Practice: 342 - Critical Area Planting

Scenario: #46 - Hand Seed and Incorporate

Scenario Description:

Establishment of permanent vegetation on disturbed sites that have high erosion rates and or physical, chemical or biological conditions that prevent the establishment of vegetation with normal practices. Costs include organic amendment and application, seedbed preparation, grass/legume seed and labor to seed by hand.

Before Situation:

Slopes that are too steep for safe equipment operation that are void or nearly void of vegetation resulting in bare soil being exposed to excessive erosion. The exposed areas may be caused by mining, construction or reclamation activities. Surface soils are typically mixtures of subsoil materials that are low in organic matter and available nitrogen and phosphorus.

After Situation:

The site is stabilized by application of organic amendments and the establishment of sodforming perennial vegetation. Seed is applied by hand at a rate high enough to adequately establish vegetation on bare soil.

Feature Measure: Area seeded

Scenario Unit: Acres

Scenario Typical Size: 1.0

Scenario Total Cost: $829.21

Scenario Cost/Unit: $829.21

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	4	$89.16
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	15	$362.85
Materials						
Compost	265	A mixture of decaying organic matter, as from leaves and manure, used to improve soil structure and provide nutrients.	Ton	$43.63	5	$218.15
Native Perennial Grasses, Medium Density	2751	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to higher density (41-60 pure live seeds/sq ft). Includes material and shipping.	Acres	$159.05	1	$159.05

Practice: 342 - Critical Area Planting

Scenario: #47 - Drill Seed

Scenario Description:

Establishment of permanent vegetation on disturbed sites that have high erosion rates and or physical, chemical or biological conditions that prevent the establishment of vegetation with normal practices. Costs include organic amendment and application, seedbed preparation, grass/legume seed, and drill application.

Before Situation:

Slopes that are too steep for safe equipment operation that are void or nearly void of vegetation resulting in bare soil being exposed to excessive erosion. The exposed areas may be caused by mining, construction or reclamation activities. Surface soils are typically mixtures of subsoil materials that are low in organic matter and available nitrogen and phosphorus.

After Situation:

The site is stabilized by application of organic amendments and the establishment of sodforming perennial vegetation. Seed is applied at a rate high enough to adequately establish vegetation on bare soil. Mulch is contracted separately to conserve soil moisture.

Feature Measure: Area seeded

Scenario Unit: Acres

Scenario Typical Size: 10.0

Scenario Total Cost: $4,826.63

Scenario Cost/Unit: $482.66

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	10	$98.90
Manure, compost, application	955	Loading, hauling and spreading manure/compost by ground equipment. Includes equipment, power unit and labor costs.	Hours	$118.82	5	$594.10
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	10	$203.10
Materials						
Compost	265	A mixture of decaying organic matter, as from leaves and manure, used to improve soil structure and provide nutrients.	Ton	$43.63	50	$2,181.50
Native Perennial Grasses, Medium Density	2751	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to higher density (41-60 pure live seeds/sq ft). Includes material and shipping.	Acres	$159.05	10	$1,590.50
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53

Practice: 345 - Residue and Tillage Management, Reduced Till

Scenario: #2 - Residue and Tillage Management, Reduced Till

Scenario Description:

Mulch-till is managing the amount, orientation and distribution of crop and other plant residue on the soil surface year round while limiting the soil-disturbing activities used to grow crops in systems where the entire field surface is tilled by the planter/drill or tillage tools prior to planting. This practice includes tillage methods commonly referred to as mulch tillage, vertical tillage, chiseling and disking, or the use of high disturbance drills without additional tillage. It applies to stubble mulching on summer-fallowed land, to tillage for annually planted crops, to tillage for planted crops and to tillage for planting perennial crops. All residue shall be uniformly spread or managed over the surface throughout the critical erosion period(s). All residue shall be uniformly distributed over the entire field and not burned or removed. These periods of intensive tillage have led to excessive soil loss, often above the soil loss tolerance (T), due to the loss of crop residue on the soil surface. The NRCS erosion prediction model(s) will be used to review the farming operations and determine the amount of surface residue to manage throughout the rotation to keep soil loss below T. The producer will adopt a reduced till system to meet one or more of the practice purposes.

Before Situation:

Crops such as corn, soybeans, small grains, or cotton are grown and harvested. Fields are tilled immediately following harvest, with rows in some fields being hipped for drainage. Residue amounts after harvest average 30% or less, resulting in bare soil being exposed to wind erosion and/or intense rainfall during the fall, winter, and early spring. Over the winter residue degrades and sediment/nutrient runoff from fields increase. Sheet, rill and wind erosion occurs. Spring tillage and seedbed preparation activities occur as early as possible in the late winter and early spring. Runoff from the fields flows into streams, water courses or other water bodies causing water quality degradation. Soil health (soil organic matter) declines over time as a result of tillage practices, low residue monocultures, and long periods of bare soil.

After Situation:

The Implementation Requirements are prepared following the criteria in the 345 Residue and Tillage Management, Reduced Till conservation practice standard. Reduced till applies to all cropland and other lands where crops are planted. This scenario includes the use of a reduce till systems and high disturbance drills, such as a hoe drill, air seeder, or no-till drill that disturbs a large percentage of soil surface during the planting operation. The residue that remains on the soil surface provides soil cover during late fall, throughout the winter, and into the early spring. Runoff and water/wind erosion are reduced and water quality improves. Over time, soil health is improved due to less tillage, the additional biomass, ground cover, soil infiltration, and plant diversity in the cropping system.

Feature Measure: Area planted

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $1,805.00

Scenario Cost/Unit: $18.05

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Seeding Operation, No Till/Strip Till Planter	1230	No Till/Strip Till row planters for seeding. Includes all costs for equipment, power unit, and labor.	Acres	$18.05	100	$1,805.00

Practice: 345 - Residue and Tillage Management, Reduced Till

Scenario: #3 - Mulch till-Adaptive Management

Scenario Description:

The practice scenario is for the implementation of mulch till in small replicated plots to allow the producer to learn how to manage mulch till on their operation. Scenario includes implementing replicated strip trials on a field plot to evaluate, identify and implement a particular mulch till management strategy (e.g., mulch till vs. conventional till, two different mulch till systems, etc.). This will be done following the guidelines outlined in Agronomy Technical Note 10 - Adaptive Management.

Before Situation:

Row crops such as corn, soybeans, or cotton are grown and harvested in mid-late fall. Fields are disked immediately following harvest, with rows in some fields being hipped for drainage. Residue amounts after harvest average 30% or less, resulting in bare soil being exposed to wind erosion and/or intense rainfall. Over the winter residue degrades and sediment/nutrient runoff from fields increases. Erosion exceeds soil loss tolerances. Spring tillage and seedbed preparation activities occur as early as possible in the late winter and early spring prior to planting. Weed control is accomplished primarily through tillage, requiring multiple operations. Runoff from the fields flows into streams, water courses or other water bodies causing degradation to the receiving waters. Soil health (soil organic matter) declines over time as a result of tillage practices, low residue monocultures, and long periods of bare soil. The producer is considering using mulch till technology, but is unsure how to manage on their operation or needs to improve the management of mulch till to be successful.

After Situation:

Implementation Requirements and the Adaptive Management Plan is prepared for the plots and implemented. Installation of this scenario will result in establishment of mulch till replicated plots to compare to different management strategies for mulch till and other residue management strategies following the guidelines outlined in Agronomy Technical Note 10 - Adaptive Management and the Adaptive Management Guidance 345 for Mulch Till. Implementation involves establishing the replicated plots to evaluate one or more reduced till management strategies. The plot will consist of at least four replicated plots designed, laid out, managed and evaluated with the assistance of a consultant knowledgeable in reduced till management. Results are used to make reduced till management decisions to address erosion, soil health, and water quality issues. Yields will be measured and statistically summarized following the procedures in Agronomy Technical Note 10 - Adaptive Management. The yields for each plot will be adjusted to the appropriate moisture content and residue levels measured as needed. This practice will be repeated for three years.

Feature Measure: Based on 20 acres

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $4,075.20

Scenario Cost/Unit: $4,075.20

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	20	$197.80
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acres	$15.10	20	$302.00
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	10	$203.10
Seeding Operation, No Till/Strip Till Planter	1230	No Till/Strip Till row planters for seeding. Includes all costs for equipment, power unit, and labor.	Acres	$18.05	10	$180.50
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	40	$967.60
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	20	$2,224.20

Practice: 345 - Residue and Tillage Management, Reduced Till

Scenario: #45 - Reduced Till Sweep for No Burn/Sweep Beds - Sugarcane Production in Louisiana

Scenario Description:

In this scenario, sugarcane producers will be migrating from a system of burning residue immediately after harvest in the fall and winter to a system that discontinues burning and allows residue to be swept into furrows. No burning will take place during the management period. Adopting this system will improve soil quality, reduce erosion, and improve air quality in sensitive areas.

Before Situation:

Sugarcane residue is typically burned immediately after harvest in the fall and early winter. After burning, beds may be reshaped with tillage. Any crop residue that is present degrades and sediment/nutrient runoff from fields increases during rainfall events. Sheet and rill erosion occurs with visible signs of soil erosion by spring. Sensitive receptors near sugarcane fields will be exposed to increased particulate matter and degraded air quality during burning events.

After Situation:

After harvest in the fall or winter, residue will be swept from the sugarcane row tops into the furrows. Residue will not be burned. In the early spring, row reshaping (off-bar and lay-by tillage) will occur as necessary. Over time, soil health is improved due to the additional crop residues, ground cover, and soil infiltration.

Feature Measure: Acres

Scenario Unit: Acres

Scenario Typical Size: 200.0

Scenario Total Cost: $3,020.00

Scenario Cost/Unit: $15.10

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acres	$15.10	200	$3,020.00

Practice: 348 - Dam, Diversion

Scenario: #1 - Rock/Gravel Fill

Scenario Description:

A rock structure with a gravel bedding on geotextile is built to divert all or part of the water from a waterway or a stream to provide water in such a manner that it can be controlled and used beneficially for irrigation, livestock water, fire control, municipal or industrial uses, develop renewable energy systems, or recreation, to divert periodic damaging flows from one watercourse to another watercourse thereby reducing the damage potential of the flows. This structure will address the resource concerns of inefficient water use on Irrigated Land, inadequate water for livestock, and inadequate water supply for other beneficial uses.

Before Situation:

This practice applies where a diversion dam is needed as an integral part of an irrigation system or a water-spreading system designed to facilitate the conservation use of soil and water resources, Diversion of water from an unstable watercourse to a stable watercourse is desirable, The water supply available is adequate for the purpose for which it is to be diverted, Adverse environmental impacts resulting from the installation of the practice can be overcome. This standard applies to structures of a permanent nature, constructed of materials having an expected life span consistent with the purpose for which the structure is designed. It does not apply where conservation practice standard Diversion (362), Floodwater Diversion (400), Dam (402), or Grade Stabilization Structure (410) would be used. This practice will provide beneficial uses for irrigation, livestock water, fire control, municipal or industrial uses, renewable energy systems, recreation, or to divert periodic damaging flows from one watercourse to another watercourse thereby reducing the damage potential of the flows.

After Situation:

A rock structure of approximately 1050 cubic yards with a gravel bedding of approximately 450 cubic yards on approximately 200 square yards of geotextile, built to divert all or part of the water from a waterway or a stream. This standard applies to structures of a permanent nature, constructed of materials having an expected life span consistent with the purpose for which the structure is designed. This structure will be an integral part of an irrigation system or a water-spreading system designed to facilitate the conservation use of soil and water resources, or diversion of water from an unstable watercourse to a stable watercourse as needed. The water supply available is adequate for the purpose for which it is to be diverted. Adverse environmental impacts resulting from the installation of the practice must be overcome. The rock structure provides beneficial uses for irrigation, livestock water, fire control, municipal or industrial uses, renewable energy systems, recreation, or to divert periodic damaging flows from one watercourse to another watercourse thereby reducing the damage potential of the flows. Any needed vegetation of disturbed areas must use Critical Area Planting (342). Other associated practices such as Channel Vegetation (322), Stream Habitat Improvement and Management (395), Channel Stabilization (584) will be as appropriate. Any needed head gates or flap gates to control the quantity of water being diverted must use Structure for Water Control (587).

Feature Measure: Fill in Cubic Yards

Scenario Unit: Cubic Yards

Scenario Typical Size: 1,500.0

Scenario Total Cost: $102,303.21

Scenario Cost/Unit: $68.20

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic Yards	$84.32	1050	$88,536.00
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	450	$13,531.50
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 348 - Dam, Diversion

Scenario: #2 - Earth Fill

Scenario Description:

An earth fill built to divert all or part of the water from a waterway or a stream to provide water in such a manner that it can be controlled and used beneficially for irrigation, livestock water, fire control, municipal or industrial uses, develop renewable energy systems, or recreation, to divert periodic damaging flows from one watercourse to another watercourse thereby reducing the damage potential of the flows. This structure will address the resource concerns of inefficient water use on Irrigated Land, inadequate water for livestock, and inadequate water supply for other beneficial uses.

Before Situation:

This practice applies where a diversion dam is needed as an integral part of an irrigation system or a water-spreading system designed to facilitate the conservation use of soil and water resources, Diversion of water from an unstable watercourse to a stable watercourse is desirable, The water supply available is adequate for the purpose for which it is to be diverted, Adverse environmental impacts resulting from the installation of the practice can be overcome. This standard applies to structures of a permanent nature, constructed of materials having an expected life span consistent with the purpose for which the structure is designed. It does not apply where conservation practice standard Diversion (362), Floodwater Diversion (400), Dam (402), or Grade Stabilization Structure (410) would be used. This practice will provide beneficial uses for irrigation, livestock water, fire control, municipal or industrial uses, renewable energy systems, recreation, or to divert periodic damaging flows from one watercourse to another watercourse thereby reducing the damage potential of the flows.

After Situation:

An earth fill structure of approximately 1500 cubic yards is built to divert all or part of the water from a waterway or a stream. This standard applies to structures of a permanent nature, constructed of materials having an expected life span consistent with the purpose for which the structure is designed. This structure will be an integral part of an irrigation system or a water-spreading system designed to facilitate the conservation use of soil and water resources, or diversion of water from an unstable watercourse to a stable watercourse as needed. The water supply available is adequate for the purpose for which it is to be diverted. Adverse environmental impacts resulting from the installation of the practice must be overcome. The earth fill structure provides beneficial uses for irrigation, livestock water, fire control, municipal or industrial uses, renewable energy systems, recreation, or to divert periodic damaging flows from one watercourse to another watercourse thereby reducing the damage potential of the flows. Any needed vegetation of disturbed areas must use Critical Area Planting (342). Other associated practices such as Channel Vegetation (322), Stream Habitat Improvement and Management (395), Channel Stabilization (584) will be as appropriate. Any needed head gates or flap gates to control the quantity of water being diverted must use Structure for Water Control (587).

Feature Measure: Volume of Earth Fill

Scenario Unit: Cubic Yards

Scenario Typical Size: 1,500.0

Scenario Total Cost: $11,238.51

Scenario Cost/Unit: $7.49

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Scraper, self propelled, 21 CY	1208	Self propelled earthmoving scraper with 21 CY capacity. Does not include labor.	Hours	$333.12	30	$9,993.60
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	30	$1,009.20
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 348 - Dam, Diversion

Scenario: #3 - Earth Fill-Grouted Rock

Scenario Description:

An earth fill and grouted rock structure built to divert all or part of the water from a waterway or a stream to provide water in such a manner that it can be controlled and used beneficially for irrigation, livestock water, fire control, municipal or industrial uses, develop renewable energy systems, or recreation, to divert periodic damaging flows from one watercourse to another watercourse thereby reducing the damage potential of the flows. This structure will address the resource concerns of inefficient water use on Irrigated Land, inadequate water for livestock, and inadequate water supply for other beneficial uses.

Before Situation:

This practice applies where a diversion dam is needed as an integral part of an irrigation system or a water-spreading system designed to facilitate the conservation use of soil and water resources, Diversion of water from an unstable watercourse to a stable watercourse is desirable, The water supply available is adequate for the purpose for which it is to be diverted, Adverse environmental impacts resulting from the installation of the practice can be overcome. This standard applies to structures of a permanent nature, constructed of materials having an expected life span consistent with the purpose for which the structure is designed. It does not apply where conservation practice standard Diversion (362), Floodwater Diversion (400), Dam (402), or Grade Stabilization Structure (410) would be used. This practice will provide beneficial uses for irrigation, livestock water, fire control, municipal or industrial uses, renewable energy systems, recreation, or to divert periodic damaging flows from one watercourse to another watercourse thereby reducing the damage potential of the flows.

After Situation:

An earth fill and grouted rock structure of approximately 1050 cubic yards of earth fill with 450 cubic yards of grouted rock is built to divert all or part of the water from a waterway or a stream. This standard applies to structures of a permanent nature, constructed of materials having an expected life span consistent with the purpose for which the structure is designed. This structure will be an integral part of an irrigation system or a water-spreading system designed to facilitate the conservation use of soil and water resources, or diversion of water from an unstable watercourse to a stable watercourse as needed. The water supply available is adequate for the purpose for which it is to be diverted. Adverse environmental impacts resulting from the installation of the practice must be overcome. The earth fill and grouted rock structure provides beneficial uses for irrigation, livestock water, fire control, municipal or industrial uses, renewable energy systems, recreation, or to divert periodic damaging flows from one watercourse to another watercourse thereby reducing the damage potential of the flows. Any needed vegetation of disturbed areas must use Critical Area Planting (342). Other associated practices such as Channel Vegetation (322), Stream Habitat Improvement and Management (395), Channel Stabilization (584) will be as appropriate. Any needed head gates or flap gates to control the quantity of water being diverted must use Structure for Water Control (587).

Feature Measure: Volume of Total Fill

Scenario Unit: Cubic Yards

Scenario Typical Size: 1,500.0

Scenario Total Cost: $59,548.17

Scenario Cost/Unit: $39.70

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Scraper, self propelled, 21 CY	1208	Self propelled earthmoving scraper with 21 CY capacity. Does not include labor.	Hours	$333.12	21	$6,995.52
Rock Riprap, grouted	1757	Grouted Rock Riprap, placed, includes materials, equipment and labor to transport and place.	Cubic Yards	$114.69	450	$51,610.50
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	21	$706.44
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 348 - Dam, Diversion

Scenario: #4 - Sheet Pile Structure

Scenario Description:

A sheet pile structure with rock, built to divert all or part of the water from a waterway or a stream to provide water in such a manner that it can be controlled and used beneficially for irrigation, livestock water, fire control, municipal or industrial uses, develop renewable energy systems, or recreation, to divert periodic damaging flows from one watercourse to another watercourse thereby reducing the damage potential of the flows. This structure will address the resource concerns of inefficient water use on Irrigated Land, inadequate water for livestock, and inadequate water supply for other beneficial uses.

Before Situation:

This practice applies where a diversion dam is needed as an integral part of an irrigation system or a water-spreading system designed to facilitate the conservation use of soil and water resources, Diversion of water from an unstable watercourse to a stable watercourse is desirable, The water supply available is adequate for the purpose for which it is to be diverted, Adverse environmental impacts resulting from the installation of the practice can be overcome. This standard applies to structures of a permanent nature, constructed of materials having an expected life span consistent with the purpose for which the structure is designed. It does not apply where conservation practice standard Diversion (362), Floodwater Diversion (400), Dam (402), or Grade Stabilization Structure (410) would be used. This practice will provide beneficial uses for irrigation, livestock water, fire control, municipal or industrial uses, renewable energy systems, recreation, or to divert periodic damaging flows from one watercourse to another watercourse thereby reducing the damage potential of the flows.

After Situation:

A sheet pile structure of approximately 3000 square feet with approximately 660 cubic yards of riprap is built to divert all or part of the water from a waterway or a stream. This standard applies to structures of a permanent nature, constructed of materials having an expected life span consistent with the purpose for which the structure is designed. This structure will be an integral part of an irrigation system or a water-spreading system designed to facilitate the conservation use of soil and water resources, or diversion of water from an unstable watercourse to a stable watercourse as needed. The water supply available is adequate for the purpose for which it is to be diverted. Adverse environmental impacts resulting from the installation of the practice must be overcome. The sheet pile structure provides beneficial uses for irrigation, livestock water, fire control, municipal or industrial uses, renewable energy systems, recreation, or to divert periodic damaging flows from one watercourse to another watercourse thereby reducing the damage potential of the flows. Any needed vegetation of disturbed areas must use Critical Area Planting (342). Other associated practices such as Channel Vegetation (322), Stream Habitat Improvement and Management (395), Channel Stabilization (584) will be as appropriate. Any needed head gates or flap gates to control the quantity of water being diverted must use Structure for Water Control (587).

Feature Measure: Area of sheet pile

Scenario Unit: Square Feet

Scenario Typical Size: 3,000.0

Scenario Total Cost: $152,377.47

Scenario Cost/Unit: $50.79

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Sheet piling, steel, 15'	1337	Steel sheet pile, panels or barrier driven up to 15 feet and left in place. Includes materials, equipment and labor.	Square Feet	$31.67	3000	$95,010.00
Portable Welder	1407	Portable field welder. Equipment only. Labor not included.	Hours	$18.64	24	$447.36
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	24	$818.88
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic Yards	$84.32	660	$55,651.20
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	1	$450.03

Practice: 348 - Dam, Diversion

Scenario: #5 - Reinforced Concrete Dam Diversion

Scenario Description:

A reinforced concrete dam diversion structure built to divert all or part of the water from a waterway or a stream to provide water in such a manner that it can be controlled and used beneficially for irrigation, livestock water, fire control, municipal or industrial uses, develop renewable energy systems, or recreation, to divert periodic damaging flows from one watercourse to another watercourse thereby reducing the damage potential of the flows. Typical scenario is a structure with an effective width of 75' and a total length of 20', effective height of 3' and maximum height of 6' and 12" thick floors and walls, containing 245 cy of reinforced concrete This structure will address the resource concerns of inefficient water use on Irrigated Land, inadequate water for livestock, and inadequate water supply for other beneficial uses.

Before Situation:

This practice applies where a diversion dam is needed as an integral part of an irrigation system or a water-spreading system designed to facilitate the conservation use of soil and water resources, Diversion of water from an unstable watercourse to a stable watercourse is desirable, The water supply available is adequate for the purpose for which it is to be diverted, Adverse environmental impacts resulting from the installation of the practice can be overcome. This standard applies to structures of a permanent nature, constructed of materials having an expected life span consistent with the purpose for which the structure is designed. It does not apply where conservation practice standard Diversion (362), Floodwater Diversion (400), Dam (402), or Grade Stabilization Structure (410) would be used. This practice will provide beneficial uses for irrigation, livestock water, fire control, municipal or industrial uses, renewable energy systems, recreation, or to divert periodic damaging flows from one watercourse to another watercourse thereby reducing the damage potential of the flows.

After Situation:

A reinforced concrete dam diversion structure of approximately 1500 cubic yards of concrete is built to divert all or part of the water from a waterway or a stream. This standard applies to structures of a permanent nature, constructed of materials having an expected life span consistent with the purpose for which the structure is designed. This structure will be an integral part of an irrigation system or a water-spreading system designed to facilitate the conservation use of soil and water resources, or diversion of water from an unstable watercourse to a stable watercourse as needed. The water supply available is adequate for the purpose for which it is to be diverted. Adverse environmental impacts resulting from the installation of the practice must be overcome. The reinforced concrete structure provides beneficial uses for irrigation, livestock water, fire control, municipal or industrial uses, renewable energy systems, recreation, or to divert periodic damaging flows from one watercourse to another watercourse thereby reducing the damage potential of the flows. Any needed vegetation of disturbed areas must use Critical Area Planting (342). Other associated practices such as Channel Vegetation (322), Stream Habitat Improvement and Management (395), Channel Stabilization (584) will be as appropriate. Any needed head gates or flap gates to control the quantity of water being diverted must use Structure for Water Control (587).

Feature Measure: Volume of Reinforced Concrete

Scenario Unit: Cubic Yards

Scenario Typical Size: 245.0

Scenario Total Cost: $341,637.26

Scenario Cost/Unit: $1,394.44

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$494.40	245	$121,128.00
Clearing and Grubbing	40	Clearing and Grubbing, includes materials, equipment and labor	Acres	$325.13	2	$650.26
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$5.40	120	$648.00
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hours	$120.60	40	$4,824.00
Excavation, common earth, large equipment, 150 ft	1223	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yards	$3.64	500	$1,820.00
Excavation, common earth, wet, side cast, large equipment	1228	Bulk excavation and side casting of wet common earth with hydraulic excavator or dragline with greater than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$4.12	150	$618.00
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	520	$17,742.40
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	4320	$104,500.80
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	720	$32,644.80
Materials						

Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic Yards	$84.32	243	$20,489.76
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	40	$1,202.80
Steel, Plate, 3/16 in.	1048	Flat Steel Plate, 3/16 inch thick, materials only.	Square Feet	$6.02	960	$5,779.20
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic Yards	$22.79	38	$866.02
Screw gate, cast iron, 3' diameter, 10/0 head	1863	3' diameter cast iron screw (canal) gate rated at 10 seating head 0 feet unseating head. Materials only.	Each	$2,756.28	10	$27,562.80
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	4	$260.36
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	2	$900.06

Practice: 348 - Dam, Diversion

Scenario: #12 - Gabion Structure

Scenario Description:

A gabion basket structure with rock fill, built to divert all or part of the water from a water way or stream, to provide water in such a manner that it can be controlled and used beneficially for irrigation, livestock water, fire control, municipal or industrial uses, develop renewable energy systems, or recreation, to divert periodic damaging flows from one watercourse to another watercourse thereby reducing the damage potential of the flows. This structure will address the resource concerns of inefficient water use on Irrigated Land, inadequate water for livestock, and inadequate water supply for other beneficial uses.

Before Situation:

This practice applies where a diversion dam is needed as an integral part of an irrigation system or a water spreading system designed to facilitate the conservation use of soil and water resources, Diversion of water from an unstable watercourse to a stable watercourse is desirable. The water supply available is adequate for the purpose for which it is to be diverted. Adverse environmental impacts resulting from the installation of the practice can be overcome. This standard applies to structures of a permanent nature, constructed of materials having an expected life span consistent with the purpose for which the structure is designed. It does not apply where conservation practice standard Diversion (362), Floodwater Diversion (400), Dam (402), or Grade Stabilization Structure would be used. This practice will provide beneficial uses for irrigation, livestock water, fire control, municipal or industrial uses, renewable energy systems, recreation, or to divert periodic damaging flows from one watercourse to another watercourse thereby reducing the damage potential of the flows.

After Situation:

A gabion basket structure of approximately 300 cubic yards is built to divert all or part of the water from a waterway or stream. This standard applies to structures of a permanent nature, constructed of materials having an expected life span consistent with the purpose for which the structure is designed. This structure will be an integral part of an irrigation system or a water-spreading system designed to facilitate the conservation use of soil and water resources, or diversion of water from an unstable watercourse to a stable watercourse as needed. The water supply available is adequate for the purpose for which it is to be diverted. Adverse environmental impacts resulting from the installation of the practice must be overcome. The gabion structure provides beneficial uses for irrigation, livestock water, fire control, municipal or industrial uses, renewable energy systems, recreation, or to divert periodic damaging flows from one watercourse to another watercourse thereby reducing the damage potential of the flows. Any needed vegetation of disturbed areas must use Critical Area Planting (342). Other associated practices such as Channel Vegetation (322), Stream Habitat Improvement and Management (395), Channel Stabilization (584) will be as appropriate. Any needed head gates or flap gates to control the quantity of water being diverted must use Structure for Water Control (587).

Feature Measure: Volume of Gabion Baskets

Scenario Unit: Cubic Yards

Scenario Typical Size: 300.0

Scenario Total Cost: $49,047.20

Scenario Cost/Unit: $163.49

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.89	16	$814.24
Seeding Operation, Broadcast, Ground	959	Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs.	Acres	$11.06	0.12	$1.33
Excavation, common earth, wet, side cast, large equipment	1228	Bulk excavation and side casting of wet common earth with hydraulic excavator or dragline with greater than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$4.12	2500	$10,300.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	320	$7,740.80
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	16	$423.36
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	80	$3,627.20
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic Yards	$84.32	300	$25,296.00
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	1	$450.03

Practice: 350 - Sediment Basin

Scenario: #1 - Excavated volume

Scenario Description:

An excavated sediment basin in an existing drainage way on a farm for purpose of trapping sediment and preserving the capacity of reservoirs, ditches, canals, diversions, waterways and streams and to prevent undesirable deposition on bottom lands and other developed lands. The sediment basin is created solely by excavation and impounds less than 3 feet against the embankment or spoil. Excavated material is spoiled, not placed in a designed embankment. Earthen spillway is constructed as needed. Resource concerns addressed include excessive suspended sediment and turbidity in surface water, damage from sediment deposition, and reduced capacity of conveyances by sediment deposition. Surface water causes the sediment (and potentially pesticides and nutrients) to be transported into the riparian areas and water bodies downstream.

Before Situation:

Disturbed areas on all land uses that have excessive erosion lead to deterioration of receiving waters due to excessive sedimentation.

After Situation:

'The typical sediment basin is constructed by excavating 1500 cubic yards and spreading the spoil outside the pool area using a dozer or similar excavation equipment. The sediment storage capacity should be a minimum of 900 cubic feet per acre of disturbed area. The detention storage should be a minimum of 3600 cubic feet per acre of drainage area. Associated practice(s): Other practices that may need to be implemented along with sediment basin to address all of the site specific resource concerns include: Critical Area Planting (342) and Mulching (484) where necessary to prevent erosion following construction activities, Structure for Water Control (587) if using a dewatering device, Pond Sealing or Lining (521A,521B,521C,521D).

Feature Measure: Excavated volume

Scenario Unit: Cubic Yards

Scenario Typical Size: 1,500.0

Scenario Total Cost: $3,266.02

Scenario Cost/Unit: $2.18

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$96.65	23	$2,222.95
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	24	$807.36
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 350 - Sediment Basin

Scenario: #2 - Embankment earthen basin with no pipe

Scenario Description:

An low hazard class embankment earthen sediment basin in an existing drainage way on a farm for purpose of trapping sediment and preserving the capacity of reservoirs, ditches, canals, diversions, waterways and streams and to prevent undesirable deposition on bottom lands and other developed lands. An earthen embankment will be constructed with an earthen auxiliary spillway, as designed. Resource concerns addressed include excessive suspended sediment and turbidity in surface water, damage from sediment deposition, and reduced capacity of conveyances by sediment deposition. Surface water causes the sediment (and potentially pesticides and nutrients) to be transported into the riparian areas and water bodies downstream.

Before Situation:

Disturbed areas on all land uses that have excessive erosion lead to deterioration of receiving waters due to excessive sedimentation.

After Situation:

The typical sediment basin is constructed by excavating the pool area, constructing the auxiliary spillway, preparing the foundation as designed, and using 1500 cubic yards to create an embankment. The embankment will be designed and constructed according the pond standard (378). The product of the storage times the effective height of the dam is less than 3,000. The effective height of the dam is 35 feet or less. The sediment storage capacity should be a minimum of 900 cubic feet per acre of disturbed area. The detention storage should be a minimum of 3600 cubic feet per acre of drainage area. The earthen auxiliary spillway will be constructed as designed based on Pond standard (378). No principal spillway will be used. Associated practice(s): Other practices that may need to be implemented along with sediment basin to address all of the site specific resource concerns include: Critical Area Planting (342) and Mulching (484) where necessary to prevent erosion following construction activities, Structure for Water Control (587) if using a dewatering device, Pond Sealing or Lining (521A,521B,521C,521D).

Feature Measure: Embankment volume

Scenario Unit: Cubic Yards

Scenario Typical Size: 1,500.0

Scenario Total Cost: $3,266.02

Scenario Cost/Unit: $2.18

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$96.65	23	$2,222.95
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	24	$807.36
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 350 - Sediment Basin

Scenario: #3 - Embankment earthen basin with pipe

Scenario Description:

An low hazard class embankment earthen sediment basin in an existing drainage way on a farm for purpose of trapping sediment and preserving the capacity of reservoirs, ditches, canals, diversions, waterways and streams and to prevent undesirable deposition on bottom lands and other developed lands. An earthen embankment will be constructed with a principal spillway conduit and earthen auxiliary spillway, as designed. Resource concerns addressed include excessive suspended sediment and turbidity in surface water, damage from sediment deposition, and reduced capacity of conveyances by sediment deposition. Surface water causes the sediment (and potentially pesticides and nutrients) to be transported into the riparian areas and water bodies downstream.

Before Situation:

Disturbed areas on all land uses that have excessive erosion lead to deterioration of receiving waters due to excessive sedimentation.

After Situation:

The typical sediment basin is constructed by excavating the pool area, constructing the auxiliary spillway, preparing the foundation as designed, and using 1500 cubic yards to create an embankment. The embankment will be designed and constructed according the Pond standard (378). The product of the storage times the effective height of the dam is less than 3,000. The effective height of the dam is 35 feet or less. The sediment storage capacity should be a minimum of 900 cubic feet per acre of disturbed area. The detention storage should be a minimum of 3600 cubic feet per acre of drainage area. The principal spillway is created using an approved conduit material and filter diaphragm. The earthen auxiliary spillway will be constructed as designed based on Pond standard (378). Associated practice(s): Other practices that may need to be implemented along with sediment basin to address all of the site specific resource concerns include: Critical Area Planting (342) and Mulching (484) where necessary to prevent erosion following construction activities, Structure for Water Control (587) if using a dewatering device, Pond Sealing or Lining (521A,521B,521C,521D).

Feature Measure: Embankment volume

Scenario Unit: Cubic Yards

Scenario Typical Size: 1,500.0

Scenario Total Cost: $8,237.98

Scenario Cost/Unit: $5.49

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$494.40	3	$1,483.20
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$96.65	23	$2,222.95
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	9	$307.08
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	23	$773.72
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic Yards	$28.74	19.6	$563.30
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	1.6	$48.11
Pipe, CMP, 18-16 gauge, weight priced	1322	18 & 16 gauge galvanized helical corrugated metal pipe priced by the weight of the pipe materials. Materials only.	Pound	$1.38	1662	$2,293.56
Trash Guard, metal	1608	Trash Guard, fabricated-steel, includes materials, equipment, and labor to transport and place Conical shaped trash guard for drop inlet spillway. Typically fabricated of CMP and steel. Includes materials, equipment, and labor to fabricate and transport.	Pound	$2.63	118	$310.34
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 351 - Well Decommissioning

Scenario: #1 - Shallow Well less than 20 ft deep

Scenario Description:

A licensed well driller will seal and permanently close an inactive, abandoned, or unusable water well to prevent excess nutrients in surface and groundwater and to eliminate pesticides transported to surface and ground water. Well will be cleared of all equipment and materials. Residual water column must be treated with chlorine concentration of >50 ppm or according to local, State, Tribal, or Federal regulations.

Before Situation:

Shallow well or hand dug well that is less than 20 feet deep. Assume 30" diameter casing. Well will be cleared of all equipment and materials. Residual water column must be treated with chlorine concentration of >50 ppm or according to local, State, Tribal, or Federal regulations.

After Situation:

Procedures and sealing materials shall conform to ASTM D5299 and be compatible with all local, State, Tribal, and Federal requirements. Backfill shall be placed and compacted in a manner that minimizes segregation and bulking to prevent surface subsidence. Associated practices: 342 Critical Area Seeding

Feature Measure: Length of well casing

Scenario Unit: Feet

Scenario Typical Size: 15.0

Scenario Total Cost: $1,728.59

Scenario Cost/Unit: $115.24

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$5.40	2.7	$14.58
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$29.47	1	$29.47
Grout pump	1334	Grout pump with tremie pipe. Equipment and power unit costs. Labor not included.	Hours	$22.82	1	$22.82
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	2	$68.24
Materials						
Grout, cement	1333	Cement grout meeting ASTM specifications for well sealing. Includes both neat-cement grout and bentonite gout mixtures. Includes materials, equipment and labor to place.	Cubic Yards	$501.26	2.7	$1,353.40
Chlorine	1335	Liquid chlorine bleach. Includes materials only.	Gallons	$4.37	1	$4.37
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 351 - Well Decommissioning

Scenario: #2 - Shallow Well greater than 20 ft deep

Scenario Description:
A licensed well driller will seal and permanently close an inactive, abandoned, or unusable water well to prevent excess nutrients in surface and groundwater and to eliminate pesticides transported to surface and ground water.

Before Situation:
Shallow or hand dug well that is greater than 30 feet deep. Assume 30" diameter casing.

After Situation:
Procedures and sealing materials shall conform to ASTM D5299 and be compatible with all local, State, Tribal, and Federal requirements. Backfill shall be placed and compacted in a manner that minimizes segregation and bulking to prevent surface subsidense. Associated practices: 342 Critical Area Seeding

Feature Measure: Length of well casing

Scenario Unit: Feet

Scenario Typical Size: 30.0

Scenario Total Cost: $3,243.99

Scenario Cost/Unit: $108.13

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$5.40	5.5	$29.70
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$29.47	2	$58.94
Grout pump	1334	Grout pump with tremie pipe. Equipment and power unit costs. Labor not included.	Hours	$22.82	1	$22.82
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	2	$68.24
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	2	$67.28
Materials						
Grout, cement	1333	Cement grout meeting ASTM specifications for well sealing. Includes both neat-cement grout and bentonite gout mixtures. Includes materials, equipment and labor to place.	Cubic Yards	$501.26	5.5	$2,756.93
Chlorine	1335	Liquid chlorine bleach. Includes materials only.	Gallons	$4.37	1	$4.37
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 351 - Well Decommissioning

Scenario: #3 - Drilled well less than 300 ft deep

Scenario Description:
A licensed well driller will seal and permanently close an inactive, abandoned, or unusable water well to prevent excess nutrients in surface and groundwater and to eliminate pesticides transported to surface and ground water.

Before Situation:
Drilled well that is less than 300 feet deep. Assume 6" diameter casing.

After Situation:
Procedures and sealing materials shall conform to ASTM D5299 and be compatible with all local, State, Tribal, and Federal requirements. Backfill shall be placed and compacted in a manner that minimizes segregation and bulking to prevent surface subsidense. Associated practices: 342 Critical Area Seeding

Feature Measure: Length of well casing

Scenario Unit: Feet

Scenario Typical Size: 200.0

Scenario Total Cost: $1,146.14

Scenario Cost/Unit: $5.73

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$29.47	1	$29.47
Grout pump	1334	Grout pump with tremie pipe. Equipment and power unit costs. Labor not included.	Hours	$22.82	1	$22.82
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	2	$68.24
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	1	$33.64
Materials						
Grout, cement	1333	Cement grout meeting ASTM specifications for well sealing. Includes both neat-cement grout and bentonite gout mixtures. Includes materials, equipment and labor to place.	Cubic Yards	$501.26	1.5	$751.89
Chlorine	1335	Liquid chlorine bleach. Includes materials only.	Gallons	$4.37	1	$4.37
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 351 - Well Decommissioning

Scenario: #4 - Drilled well greater than 300 ft deep

Scenario Description:
A licensed well driller will seal and permanently close an inactive, abandoned, or unusable water well to prevent excess nutrients in surface and groundwater and to eliminate pesticides transported to surface and ground water.

Before Situation:
Drilled well that is greater than 300 feet deep. Assume 6" diameter casing.

After Situation:
Procedures and sealing materials shall conform to ASTM D5299 and be compatible with all local, State, Tribal, and Federal requirements. Backfill shall be placed and compacted in a manner that minimizes segregation and bulking to prevent surface subsidense. Associated practices: 342 Critical Area Seeding

Feature Measure: Length of well casing

Scenario Unit: Feet

Scenario Typical Size: 500.0

Scenario Total Cost: $2,283.03

Scenario Cost/Unit: $4.57

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$29.47	1	$29.47
Grout pump	1334	Grout pump with tremie pipe. Equipment and power unit costs. Labor not included.	Hours	$22.82	1	$22.82
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	3	$102.36
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	1	$33.64
Materials						
Grout, cement	1333	Cement grout meeting ASTM specifications for well sealing. Includes both neat-cement grout and bentonite gout mixtures. Includes materials, equipment and labor to place.	Cubic Yards	$501.26	3.7	$1,854.66
Chlorine	1335	Liquid chlorine bleach. Includes materials only.	Gallons	$4.37	1	$4.37
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 353 - Monitoring Well

Scenario: #1 - Borehole, 200 Ft. Depth or Less

Scenario Description:

A vertical borehole designed and installed 200 feet or less in depth to obtain representative groundwater quality samples and hydrogeologic information. The well provides controlled access for sampling groundwater near an agricultural waste storage or treatment facility to detect seepage and monitor groundwater quality. Installation methods must be in conformance with ASTM D5092. The resource concerns addressed include groundwater contamination and groundwater quality.

Before Situation:

This practice applies to the design, installation, and development of monitoring wells where contamination of groundwater from an agricultural waste storage or treatment facility is a concern, detection of seepage and monitoring of groundwater quality is needed, and the facility is a component of an agricultural waste management system.

After Situation:

Typical installation of a vertical borehole for a monitoring well 100 feet deep that provides controlled access to obtain water samples for detecting seepage and monitoring of groundwater quality from an agricultural waste storage or treatment facility as a component of an agricultural waste management system. The monitoring well is installed by drilling an 8 inch borehole, installing a protective casing, a 2 inch riser pipe, a well screen, and filter pack. The installation method was in conformance with ASTM D5092. Vegetation of disturbed areas will be completed under critical area planting (342). Erosion control during construction activities will use Stormwater Runoff Control (570). Other associated practices include Access Control (472), Water Well Decommissioning (351), Waste Storage Facility (313), Waste Treatment Lagoon (359), and Pumping Plant (533).

Feature Measure: Depth of Well

Scenario Unit: Feet

Scenario Typical Size: 100.0

Scenario Total Cost: $10,674.23

Scenario Cost/Unit: $106.74

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Rotary Drill Rig	1595	Rotary drill rig including equipment and power unit costs. Labor not included.	Hours	$311.84	24	$7,484.16
Materials						
Bentonite	41	Bentonite, includes materials (50# bag)	Each	$21.52	6	$129.12
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	6	$180.42
Aggregate, gravel, washed, pea gravel	1331	Washed and graded pea gravel river stone. Includes materials and local delivery within 20 miles of quarry.	Cubic Yards	$32.33	3	$96.99
Grout, cement	1333	Cement grout meeting ASTM specifications for well sealing. Includes both neat-cement grout and bentonite gout mixtures. Includes materials, equipment and labor to place.	Cubic Yards	$501.26	3	$1,503.78
Well Cap, 6 in.	1786	Well cap, 6 inch. Materials only.	Each	$38.27	1	$38.27
Well Casing, Metal, 6 in.	1810	Steel well casing, 6 inch. Materials only.	Feet	$20.66	20	$413.20
Well Screen, plastic, 2 in.	1997	2 inch PVC well screen. Materials only.	Feet	$5.44	25	$136.00
Pipe, PVC, Flush Thread, 2 in. SCH 40	2295	Flush thread PVC riser pipe, 2 in. diameter, schedule 40. Materials only.	Feet	$1.63	110	$179.30
Centralizer, stainless steel, 2 inch	2298	Stainless steel centralizer to stabilize and center pipe in groundwater monitoring and other well installations. Materials only.	Each	$27.50	10	$275.00
End Cap, PVC, 2 in.	2301	PVC End cap used in groundwater monitoring and other well installations. Materials only.	Each	$2.28	1	$2.28
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 353 - Monitoring Well

Scenario: #2 - Borehole, Greater Than 200 Ft. Depth

Scenario Description:

A vertical borehole designed and installed greater than 200 feet deep to obtain representative groundwater quality samples and hydrogeologic information. The well provides controlled access for sampling groundwater near an agricultural waste storage or treatment facility to detect seepage and monitor groundwater quality. Installation methods must be in conformance with ASTM D5092. The resource concerns addressed include groundwater contamination and groundwater quality.

Before Situation:

This practice applies to the design, installation, and development of monitoring wells where contamination of groundwater from an agricultural waste storage or treatment facility is a concern, detection of seepage and monitoring of groundwater quality is needed, and the facility is a component of an agricultural waste management system.

After Situation:

Typical installation of a vertical borehole for a monitoring well 300 feet deep that provides controlled access to obtain water samples for detecting seepage and monitoring of groundwater quality from an agricultural waste storage or treatment facility as a component of an agricultural waste management system. The monitoring well is installed by drilling an 8 inch borehole, installing a protective casing, a 2 inch monitoring-riser pipe, a well screen, and filter pack. The installation method was in conformance with ASTM D5092. Vegetation of disturbed areas will be completed under critical area planting (342). Erosion control during construction activities will use Stormwater Runoff Control (570). Other associated practices include Access Control (472), Water Well Decommissioning (351), Waste Storage Facility (313), Waste Treatment Lagoon (359), and Pumping Plant (533).

Feature Measure: Depth of Well

Scenario Unit: Feet

Scenario Typical Size: 300.0

Scenario Total Cost: $33,902.98

Scenario Cost/Unit: $113.01

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Rotary Drill Rig	1595	Rotary drill rig including equipment and power unit costs. Labor not included.	Hours	$311.84	90	$28,065.60
Materials						
Bentonite	41	Bentonite, includes materials (50# bag)	Each	$21.52	12	$258.24
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	12	$360.84
Aggregate, gravel, washed, pea gravel	1331	Washed and graded pea gravel river stone. Includes materials and local delivery within 20 miles of quarry.	Cubic Yards	$32.33	6	$193.98
Grout, cement	1333	Cement grout meeting ASTM specifications for well sealing. Includes both neat-cement grout and bentonite gout mixtures. Includes materials, equipment and labor to place.	Cubic Yards	$501.26	6	$3,007.56
Well Cap, 6 in.	1786	Well cap, 6 inch. Materials only.	Each	$38.27	1	$38.27
Well Casing, Metal, 6 in.	1810	Steel well casing, 6 inch. Materials only.	Feet	$20.66	20	$413.20
Well Screen, plastic, 2 in.	1997	2 inch PVC well screen. Materials only.	Feet	$5.44	50	$272.00
Pipe, PVC, Flush Thread, 2 in. SCH 40	2295	Flush thread PVC riser pipe, 2 in. diameter, schedule 40. Materials only.	Feet	$1.63	310	$505.30
Centralizer, stainless steel, 2 inch	2298	Stainless steel centralizer to stabilize and center pipe in groundwater monitoring and other well installations. Materials only.	Each	$27.50	20	$550.00
End Cap, PVC, 2 in.	2301	PVC End cap used in groundwater monitoring and other well installations. Materials only.	Each	$2.28	1	$2.28
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 355 - Groundwater Testing

Scenario: #1 - Basic Water Test

Scenario Description:

Typical scenario includes the professional testing for nitrates, nitrites, and coliform to confirm well water meets basic water quality standards for consumption by livestock or use in irrigation. Water samples are sent to an EPA or state certified laboratory for testing. This scenario is recommended when water quality is suspected to be acceptable.

Before Situation:

There are no known contaminants of the well, however, neighboring wells have known issues with nitrates, or coliform, and confirmation of acceptable water quality is desired. Manure is spread near to the well, following a nutrient management plan; well contamination is unlikely but possible.

After Situation:

Water quality results are known.

Feature Measure: No.

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $62.26

Scenario Cost/Unit: $62.26

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	0.5	$12.10
Materials						
Test, Standard Water Test, Irrigation Suitability	310	Irrigation water suitability lab analysis. Includes pH, alkalinity, carbonates/bicarbonates, EC, dissolved solids, B, Cl, Ca, Mg, Na, SAR, and hardness.	Each	$50.16	1	$50.16

Practice: 355 - Groundwater Testing

Scenario: #2 - Specialty Water Test

Scenario Description:

Typical scenario includes the professional testing for pesticides, heavy metals, VOC's or other less common substances, in addition to the basic water test items. Tests are intended to confirm well water meets water quality standards for consumption by livestock or use in irrigation. Water samples are sent to an EPA or state certified laboratory for testing. This scenario is recommended when water quality is suspected to be degraded due to a specialized substance.

Before Situation:

There are no known contaminants of the well, however, neighboring wells have known issues with water quality, and confirmation of acceptable water quality is desired. Manure, pesticides, or other potential contaminants have been spread near to the well, in an unmanaged manner; well contamination is possible.

After Situation:

Water quality results are known.

Feature Measure: No.

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $245.09

Scenario Cost/Unit: $245.09

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	0.5	$12.10
Materials						
Test, Standard Water Test, Irrigation Suitability	310	Irrigation water suitability lab analysis. Includes pH, alkalinity, carbonates/bicarbonates, EC, dissolved solids, B, Cl, Ca, Mg, Na, SAR, and hardness.	Each	$50.16	1	$50.16
Test, singular specialized water test, well water	2003	Testing for specific pesticide, inorganic chemical or volatile organic not included in a basic well suitability test.. Includes materials and shipping only.	Each	$182.83	1	$182.83

Practice: 355 - Groundwater Testing

Scenario: #3 - Full Spectrum Test

Scenario Description:

Typical scenario includes the professional comprehensive testing for all less common substances, to include: pesticides, heavy metals, VOC's or other less common substances, in addition to the basic water test items. Tests are intended to confirm well water meets water quality standards for consumption by livestock or use in irrigation. Water samples are sent to an EPA or state certified laboratory for testing. This scenario is recommended when water quality is known to be degraded due to a specialized substance but thorough analysis is warranted.

Before Situation:

There are no known contaminants of the well, however, neighboring wells have known issues with water quality, and confirmation of acceptable water quality is desired. Manure, pesticides, sewage sludge, or other potential contaminants have been spread near to the well, in an unmanaged manner; well contamination is likely.

After Situation:

Water quality results are known.

Feature Measure: No.

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $292.92

Scenario Cost/Unit: $292.92

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	0.5	$12.10
Materials						
Test, Standard Water Test, Irrigation Suitability	310	Irrigation water suitability lab analysis. Includes pH, alkalinity, carbonates/bicarbonates, EC, dissolved solids, B, Cl, Ca, Mg, Na, SAR, and hardness.	Each	$50.16	1	$50.16
Test, comprehensive specialized water test, well water	2002	Comprehensive testing for a broad spectrum of pesticides, inorganic chemicals or volatile organics not included in a basic well suitability test. Includes materials and shipping only.	Each	$230.66	1	$230.66

Practice: 356 - Dike

Scenario: #1 - Dike

Scenario Description:

Construction of a earthen embankment barrier to control water flow and level. Associated practices include: PS342 Critical Area Planting, PS382 Fence, PS464 Irrigation Land Levelling, PS587 Structure for Water Control

Before Situation:

Site is subject to flooding or overland flow which poses a potential for damage to land or property. Site may also require control of water level for purposes connected with crop production; fish and wildlife managment; or wetland maintenance, improvement, restoration, or construction. An adequate quantity of soil suitable for constructing an earthen dike is available at an economical haul distance. Resource concerns include Soil Erosion, Excessive runoff, flooding or ponding

After Situation:

Water level controlled by a stable earthen structure. Potential hazard to public safety, land or property mitigated; environmental benefit provided.

Feature Measure: Volume of Earthfill

Scenario Unit: Cubic Yards

Scenario Typical Size: 500.0

Scenario Total Cost: $1,275.71

Scenario Cost/Unit: $2.55

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	500	$1,040.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 359 - Waste Treatment Lagoon

Scenario: #1 - Waste Treatment Lagoon

Scenario Description:

A waste treatment lagoon is a component of a waste management system that provides biological treatment of manure and other byproducts of animal agricultural operations by reducing the pollution potential. Resource concern addressed is water quality by reducing the pollution potential to surface and groundwater by treating and storing liquid waste. Earthen lagoon liners are addressed with another standard. This scenario intended for embankment or excavated lagoon. Potential Associated Practices: Pond Sealing or Lining, Compacted Soil (520), Pond Sealing or Lining, Concrete (522), Pond Sealing or Lining, Geomembrane or Geosynthetic Clay Liner (521), Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), and Waste Separation Facility (632).

Before Situation:

Operator presently has a confined animal feeding operation without a waste management system adequate to handle the waste stream leaving the animal production facilities. Manure and other agricultural waste by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or are being transported but not properly utilized or disposed. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources.

After Situation:

A waste treatment lagoon constructed from on-site material provides an environmentally safe facility for storing manure and other agricultural waste by-products. This facility provides the landowner a means of storing and treating waste until it can be utilized in a proper manner in accordance with a nutrient management plan. Excavated material used to build an embankment around the lagoon so this is a combination excavated/embankment design. Typical design size : Design Volume 492,129 cf = 18,227 cy; 260' X 208' (top); 3:1 inside and outside side slopes; cut/fill ratio = 1.25; total depth = 13' which includes 1' freeboard Feature Measure = Design Volume [Operational Volume + emergency volume + freeboard]

Feature Measure: Design Volume (Operational + eme

Scenario Unit: Cubic Feet

Scenario Typical Size: 492,129.0

Scenario Total Cost: $100,984.69

Scenario Cost/Unit: $0.21

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	9102	$38,137.38
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.42	8101	$27,705.42
Stripping and stockpiling, topsoil	1199	Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor.	Cubic Yards	$0.87	1389	$1,208.43
Excavation, common earth, large equipment, 150 ft	1223	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yards	$3.64	9125	$33,215.00
Materials						
Structural steel tubing, 2 in. diameter	1120	Structural steel tubing, 2 inch diameter, 1/8 inch wall thickness, materials only	Feet	$4.09	8	$32.72
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	1	$450.03

Practice: 360 - Waste Facility Closure

Scenario: #1 - Poultry House Soil Remediation

Scenario Description:

This practice scenario includes the remediation of the soil in an abandoned poultry structures previously used to store poultry waste (litter) on an earthen floor. The purpose of the practice is to address resource concerns related to water quality degradation due to excess nutrient and pathogens in ground and/or surface waters and air quality impacts from greenhouse gases, particulate matter and associated precursors, and objectionable odors. Associated practices: Nutrient Management (590), Critical Area Planting (342).

Before Situation:

The abandoned poultry house has a damaged roof exposing the earthen floor of the structure to rainfall. Rainfall and nutrients on the floor of the house pose a risk to surface water from contaminated runoff or to ground water from seepage into the underlying soils.

After Situation:

This scenario is based on a 40' wide x 400' long poultry house with 1 foot depth of nutrient laden soil to remediate (16,000 CF). Payment under this scenario includes only activities associated with the soil remediation. Soil remediation activities in this scenario include removing the nutrient enriched soil found in the first 7 inches of soil beneath the litter floor and mixing wood chips with the remaining 5 inches of soil. Nutrient level testing and field application of the removed soil shall be performed according to nutrient planning in conformance with Nutrient Management, Code 590. The remaining 5 inches of soil will be remediated in-situ by mixing in wood chips, at a rate of 33% of the volume of remaining soil, for the purpose of nitrogen sequestration. Additional soil will be hauled in (estimated at 110% of the soil volume that was removed for field application) to backfill the depression. Shaping and crowning of the soil material on the disturbed area and critical area seeding will be done to provide drainage, complete the site remediation and establish vegetation. Operation and maintenance of the site will include nutrient testing the following year to determine if the nutrients in the mixed soil have been remediated and surface and ground water resource concerns have been addressed. In this scenario, samples at four (4) locations will be taken at 6, 12, 18 and 24 inches at the end of Year 1.

Feature Measure: Cubic feet of soil remediated

Scenario Unit: Cubic Feet

Scenario Typical Size: 16,000.0

Scenario Total Cost: $14,317.76

Scenario Cost/Unit: $0.89

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.42	380	$1,299.60
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$100.83	31	$3,125.73
Manure, compost, application	955	Loading, hauling and spreading manure/compost by ground equipment. Includes equipment, power unit and labor costs.	Hours	$118.82	19	$2,257.58
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$46.88	1	$46.88
Aggregate, Wood Chips	1098	Includes materials, equipment and labor	Cubic Yards	$50.28	82	$4,122.96
Front End Loader, 185 HP	1619	Wheeled front end loader with horsepower range of 160 to 210. Equipment and power unit costs. Labor not included.	Hours	$100.06	6	$600.36
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	1	$26.46
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	31	$1,042.84
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$11.76	16	$188.16
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	3	$707.13
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	2	$900.06

Practice: 360 - Waste Facility Closure

Scenario: #2 - Feedlot Closure

Scenario Description:

This practice scenario includes the remediation of the soil on an abandoned feedlot previously used to feed animals on a bare earthen lot. The purpose of the practice is to address resource concerns related to water quality degradation due to excess nutrient and pathogens in ground and/or surface waters and air quality impacts from greenhouse gases, particulate matter and associated precursors, and objectionable odors. Associated practices: Nutrient Management (590), Critical Area Planting (342).

Before Situation:

The feedlot is abandoned. Vegetation has not been reestablished. The high level of nutrients in the soil is preventing volunteer establishment of native vegetation. Rainfall and nutrients on the bare earth feedlot pose a risk to surface water from contaminated runoff or to ground water from seepage into the underlying soils.

After Situation:

This scenario is based on a 3 acre feedlot. Surveys and testing have determined the manure pack averages 8 inches in depth and the level of nutirients in the 4 inches of soil below the manure pack is too high to treat insitu with vegetation. Payment under this scenario includes only activities associated with the soil remediation. Soil remediation activities in this scenario include removing the nutrient enriched manure pack and soil, an average of 12 inches below the existing surface (130,680 CF). The excavated surface will be vegetated with a mix of salt tolerant plants in conformance with Critical Area Planting, Code 342. Nutrient level testing and field application of the removed soil shall be performed according to nutrient planning in conformance with Nutrient Management, Code 590. Shaping and crowning of the soil material on the disturbed area and critical area seeding will be done to provide drainage, complete the site remediation and establish vegetation. Operation and maintenance of the site will include nutrient testing the following year to determine if the soil has been remediated and surface and ground water resource concerns have been addressed. In this scenario, samples at four (4) locations will be taken at 6, 12, 18 and 24 inches at the end of Year 1. Fence and feedbunk removal is to be performed under Obstruction Removal, Code 500.

Feature Measure: Cubic feet of soil remediated

Scenario Unit: Cubic Feet

Scenario Typical Size: 130,680.0

Scenario Total Cost: $38,000.96

Scenario Cost/Unit: $0.29

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$100.83	40	$4,033.20
Manure, compost, application	955	Loading, hauling and spreading manure/compost by ground equipment. Includes equipment, power unit and labor costs.	Hours	$118.82	269	$31,962.58
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	40	$1,345.60
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$11.76	16	$188.16
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 360 - Waste Facility Closure

Scenario: #3 - Demolition of Concrete Waste Storage Structure

Scenario Description:

This practice scenario includes the demolition of a concrete waste storage structure. The purpose of the practice is to address resource concerns related to water quality degradation due to excess nutrient and pathogens in ground and/or surface waters and air quality impacts from greenhouse gases, particulate matter and associated precursors, and objectionable odors. Associated practices: Nutrient Management (590), Critical Area Planting (342)

Before Situation:

An existing concrete waste storage structure is no longer functioning correctly or is not being used for its intended purpose. It poses a safety hazard for humans and livestock and is a threat to environmental sustainability by the potential for impacts to water and air quality.

After Situation:

This scenario assumes a concrete waste storage structure, with top dimensions of 60 ft x 60 ft with 10 ft vertical walls. The walls are 8 inches thick, the concrete floor is 5 inches thick and the footing for the wall is 12 inches wide by 24 inches deep. The total structural storage volume equals 36,000 cubic feet. The total volume of concrete to be demolished is 3,580 cubic feet ([2 X (60 ft + 60 ft) X 10ft X 8in /12 in/ft] + [60 ft X 60 ft X 5in /12 in/ft] + [2 X (60 ft + 60 ft) X 12in /12 in/ft X 24in /12in/ft]). The volume of waste to be removed approximately equals 50% of the structural volume (50% X 36,000 = 18,000 CF). The volume of earthwork (earthfill and/or excavation, final grading) required is approximately 50% of the structural volume. The concrete will be demolished and hauled off-site for recycling or disposal. Structural removal, as necessary, may include the sealing or removal and disposal of waste transfer components and other appurtenances associated with closure of the facility. Demolition of a concrete waste storage structure includes agitating, removing, and spreading the waste remaining in the structure. All waste material shall be land applied in accordance with Nutrient Management (590). Excavated areas will be filled in. The disturbed areas shall be vegetated in accordance with Critical Area Planting (342). Demolition of the concrete waste structure will address water quality degradation, air quality impacts and safety hazards by removing and properly utilizing the waste from the impoundment. The site will also become available for another use.

Feature Measure: Cubic Feet of concrete to be demoli

Scenario Unit: Cubic Feet

Scenario Typical Size: 3,580.0

Scenario Total Cost: $8,959.99

Scenario Cost/Unit: $2.50

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	667	$2,794.73
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$100.83	10	$1,008.30
Manure, compost, injection	956	Loading, hauling and injecting manure/compost by ground equipment. Includes equipment, power unit and labor costs.	Gallons	$0.01	134640	$1,346.40
Demolition, concrete	1498	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yards	$11.03	133	$1,466.99
Hauling, bulk, highway truck	1615	Hauling of bulk earthfill, rockfill, waste or debris. One-way travel distance using fully loaded highway dump trucks (typically 16 CY or 20 TN capacity). Includes equipment and labor for truck only. Does not include cost for loading truck.	Cubic Yard Mile	$0.28	1330	$372.40
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	10	$241.90
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	10	$336.40
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	4	$942.84
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	1	$450.03

Practice: 360 - Waste Facility Closure

Scenario: #4 - Liquid Waste Impoundment Closure with 75% Liquids and 25% Solids

Scenario Description:

This practice scenario includes the decommissioning of an earthen liquid waste impoundment (embankment or excavated type) where the estimated volume of waste to be removed is approximately 75% liquid/slurry waste and 25% sludge/solid waste of the structural storage capacity of the structure. The purpose of the practice is to address resource concerns related to water quality degradation due to excess nutrient and pathogens in ground and/or surface waters and air quality impacts from greenhouse gases, particulate matter and associated precursors, and objectionable odors. Associated practices: Nutrient Management (590), Critical Area Planting (342)

Before Situation:

An existing lagoon or waste storage pond is no longer functioning correctly or is not being used for its intended purpose. It poses a safety hazard for humans and livestock and is a threat to environmental sustainability by the potential for impacts to water and air quality.

After Situation:

This scenario assumes a waste storage pond, with top dimensions of 110 ft x 110 ft, 8 ft total depth with 2:1 side slopes. The total structural storage volume equals 63,851 cubic feet. The volume of liquid waste to be pumped approximately equals 75% if the structural volume (75% X 63,851 CF = 47,888 CF). The volume of solid waste to be removed approximately equals 25% of the structural volume (25% X 63,851 = 15,963 CF). The volume of earthwork (earthfill and excavation) required to breach the embankment and/or fill in the impoundment and perform final grading of the site is approximately 50% of the structural volume. The volume of earthwork will include 60% as excavation and 40% as compacted earthfill. Structural removal, as necessary, may include the removal and disposal of the synthetic liner, sealing or removal and disposal of waste transfer components and other appurtenances associated with closure of the facility. Decommissioning of a liquid waste storage impoundment includes agitating, removing, and spreading liquid/slurry waste material, removing solid/sludge waste remaining in the bottom. All waste material shall be land applied in accordance with Nutrient Management (590). If present, the synthetic liner will be removed and properly disposed of. All inflow devices and associated appurtenances will be removed and properly disposed of. The embankment will be breached and the excavation filled in with the embankment material or hauled in earthfill. The disturbed areas shall be vegetated in accordance with Critical Area Planting (342). Closure of the waste impoundment will address water quality degradation, air quality impacts and safety hazards by removing and properly utilizing the waste from the impoundment. The site will also become available for another use.

Feature Measure: Cubic feet of structural storage

Scenario Unit: Cubic Feet

Scenario Typical Size: 63,851.0

Scenario Total Cost: $13,528.02

Scenario Cost/Unit: $0.21

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	709	$1,474.72
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	473	$1,981.87
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$100.83	12	$1,209.96
Manure, compost, injection	956	Loading, hauling and injecting manure/compost by ground equipment. Includes equipment, power unit and labor costs.	Gallons	$0.01	358204	$3,582.04
Spreading, manure sludge	1633	Loading, hauling and spreading manure solids/sludge by ground equipment on nearby fields. Includes equipment, power unit and labor costs.	Cubic Feet	$0.20	15963	$3,192.60
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	12	$290.28
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	12	$403.68
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	4	$942.84
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	1	$450.03

Practice: 360 - Waste Facility Closure

Scenario: #5 - Liquid Waste Impoundment Closure with 50% Liquids and 50% Solids

Scenario Description:

This practice scenario includes the decommissioning of an earthen liquid waste impoundment (embankment or excavated type) where the estimated volume of waste to be removed is approximately 50% liquid/slurry waste and 50% sludge/solid waste of the structural storage capacity of the structure. The purpose of the practice is to address resource concerns related to water quality degradation due to excess nutrient and pathogens in ground and/or surface waters and air quality impacts from greenhouse gases, particulate matter and associated precursors, and objectionable odors. Associated practices: Nutrient Management (590), Critical Area Planting (342)

Before Situation:

An existing lagoon or waste storage pond is no longer functioning correctly or is not being used for its intended purpose. It poses a safety hazard for humans and livestock and is a threat to environmental sustainability by the potential for impacts to water and air quality.

After Situation:

This scenario assumes a waste storage pond, with top dimensions of 110 ft x 110 ft, 8 ft total depth with 2:1 side slopes. The total structural storage volume equals 63,851 cubic feet. The volume of liquid waste to be pumped approximately equals 50% if the structural volume (50% X 63,851 CF = 31,925 CF). The volume of solid waste to be removed approximately equals 50% of the structural volume (50% X 63,851 = 31,925 CF). The volume of earthwork (earthfill and excavation) required to breach the embankment and/or fill in the impoundment and perform final grading of the site is approximately 50% of the structural volume. The volume of earthwork will include 60% as excavation and 40% as compacted earthfill. Structural removal, as necessary, may include the removal and disposal of the synthetic liner, sealing or removal and disposal of waste transfer components and other appurtenances associated with closure of the facility. Decommissioning of a liquid waste storage impoundment includes agitating, removing, and spreading liquid/slurry waste material, removing solid/sludge waste remaining in the bottom. All waste material shall be land applied in accordance with Nutrient Management (590). If present, the synthetic liner will be removed and properly disposed of. All inflow devices and associated appurtenances will be removed and properly disposed of. The embankment will be breached and the excavation filled in with the embankment material or hauled in earthfill. The disturbed areas shall be vegetated in accordance with Critical Area Planting (342). Closure of the waste impoundment will address water quality degradation, air quality impacts and safety hazards by removing and properly utilizing the waste from the impoundment. The site will also become available for another use.

Feature Measure: Cubic feet of structural storage

Scenario Unit: Cubic Feet

Scenario Typical Size: 63,851.0

Scenario Total Cost: $15,526.41

Scenario Cost/Unit: $0.24

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	709	$1,474.72
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	473	$1,981.87
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$100.83	12	$1,209.96
Manure, compost, injection	956	Loading, hauling and injecting manure/compost by ground equipment. Includes equipment, power unit and labor costs.	Gallons	$0.01	238803	$2,388.03
Spreading, manure sludge	1633	Loading, hauling and spreading manure solids/sludge by ground equipment on nearby fields. Includes equipment, power unit and labor costs.	Cubic Feet	$0.20	31925	$6,385.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	12	$290.28
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	12	$403.68
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	4	$942.84
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	1	$450.03

Practice: 360 - Waste Facility Closure

Scenario: #6 - Liquid Waste Impoundment Closure with 25% Liquids and 75% Solids

Scenario Description:

This practice scenario includes the decommissioning of an earthen liquid waste impoundment (embankment or excavated type) where the estimated volume of waste to be removed is approximately 25% liquid/slurry waste and 75% sludge/solid waste of the structural storage capacity of the structure. The purpose of the practice is to address resource concerns related to water quality degradation due to excess nutrient and pathogens in ground and/or surface waters and air quality impacts from greenhouse gases, particulate matter and associated precursors, and objectionable odors. Associated practices: Nutrient Management (590), Critical Area Planting (342)

Before Situation:

An existing lagoon or waste storage pond is no longer functioning correctly or is not being used for its intended purpose. It poses a safety hazard for humans and livestock and is a threat to environmental sustainability by the potential for impacts to water and air quality.

After Situation:

This scenario assumes a waste storage pond, with top dimensions of 110 ft x 110 ft, 8 ft total depth with 2:1 side slopes. The total structural storage volume equals 63,851 cubic feet. The volume of liquid waste to be pumped approximately equals 25% if the structural volume (25% X 63,851 CF = 15,9635 CF). The volume of solid waste to be removed approximately equals 75% of the structural volume (75% X 63,851 = 47,888 CF). The volume of earthwork (earthfill and excavation) required to breach the embankment and/or fill in the impoundment and perform final grading of the site is approximately 50% of the structural volume. The volume of earthwork will include 60% as excavation and 40% as compacted earthfill. Structural removal, as necessary, may include the removal and disposal of the synthetic liner, sealing or removal and disposal of waste transfer components and other appurtenances associated with closure of the facility. Decommissioning of a liquid waste storage impoundment includes agitating, removing, and spreading liquid/slurry waste material, removing solid/sludge waste remaining in the bottom. All waste material shall be land applied in accordance with Nutrient Management (590). If present, the synthetic liner will be removed and properly disposed of. All inflow devices and associated appurtenances will be removed and properly disposed of. The embankment will be breached and the excavation filled in with the embankment material or hauled in earthfill. The disturbed areas shall be vegetated in accordance with Critical Area Planting (342). Closure of the waste impoundment will address water quality degradation, air quality impacts and safety hazards by removing and properly utilizing the waste from the impoundment. The site will also become available for another use.

Feature Measure: Cubic feet of structural storage

Scenario Unit: Cubic Feet

Scenario Typical Size: 63,851.0

Scenario Total Cost: $17,524.99

Scenario Cost/Unit: $0.27

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	709	$1,474.72
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	473	$1,981.87
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$100.83	12	$1,209.96
Manure, compost, injection	956	Loading, hauling and injecting manure/compost by ground equipment. Includes equipment, power unit and labor costs.	Gallons	$0.01	119401	$1,194.01
Spreading, manure sludge	1633	Loading, hauling and spreading manure solids/sludge by ground equipment on nearby fields. Includes equipment, power unit and labor costs.	Cubic Feet	$0.20	47888	$9,577.60
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	12	$290.28
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	12	$403.68
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	4	$942.84
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	1	$450.03

Practice: 360 - Waste Facility Closure

Scenario: #7 - Liquid Waste Impoundment Closure with 0% Liquids and 100% Solids

Scenario Description:

This practice scenario includes the decommissioning of an earthen liquid waste impoundment (embankment or excavated type) where the estimated volume of waste to be removed is approximately 0% liquid/slurry waste and 100% sludge/solid waste of the structural storage capacity of the structure. The purpose of the practice is to address resource concerns related to water quality degradation due to excess nutrient and pathogens in ground and/or surface waters and air quality impacts from greenhouse gases, particulate matter and associated precursors, and objectionable odors. Associated practices: Nutrient Management (590), Critical Area Planting (342)

Before Situation:

An existing lagoon or waste storage pond is no longer functioning correctly or is not being used for its intended purpose. It poses a safety hazard for humans and livestock and is a threat to environmental sustainability by the potential for impacts to water and air quality.

After Situation:

This scenario assumes a waste storage pond, with top dimensions of 110 ft x 110 ft, 8 ft total depth with 2:1 side slopes. The total structural storage volume equals 63,851 cubic feet. The volume of liquid waste to be pumped approximately equals 0% of the structural volume. The volume of solid waste to be removed approximately equals 100% of the structural volume (63,851 CF). The volume of earthwork (earthfill and excavation) required to breach the embankment and/or fill in the impoundment and perform final grading of the site is approximately 50% of the structural volume. The volume of earthwork will include 60% as excavation and 40% as compacted earthfill. Structural removal, as necessary, may include the removal and disposal of the synthetic liner, sealing or removal and disposal of waste transfer components and other appurtenances associated with closure of the facility. Decommissioning of a liquid waste storage impoundment includes agitating, removing, and spreading liquid/slurry waste material, removing solid/sludge waste remaining in the bottom. All waste material shall be land applied in accordance with Nutrient Management (590). If present, the synthetic liner will be removed and properly disposed of. All inflow devices and associated appurtenances will be removed and properly disposed of. The embankment will be breached and the excavation filled in with the embankment material or hauled in earthfill. The disturbed areas shall be vegetated in accordance with Critical Area Planting (342). Closure of the waste impoundment will address water quality degradation, air quality impacts and safety hazards by removing and properly utilizing the waste from the impoundment. The site will also become available for another use.

Feature Measure: Cubic feet of structural storage

Scenario Unit: Cubic Feet

Scenario Typical Size: 63,851.0

Scenario Total Cost: $19,287.87

Scenario Cost/Unit: $0.30

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	709	$1,474.72
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	473	$1,981.87
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$100.83	12	$1,209.96
Spreading, manure sludge	1633	Loading, hauling and spreading manure solids/sludge by ground equipment on nearby fields. Includes equipment, power unit and labor costs.	Cubic Feet	$0.20	63851	$12,770.20
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	12	$290.28
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	12	$403.68
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	3	$707.13
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	1	$450.03

Practice: 360 - Waste Facility Closure

Scenario: #8 - Liquid Waste Impoundment Conversion to Fresh Water Storage with 75% Liquids and 25% Solids

Scenario Description:

This practice scenario includes the conversion of an earthen liquid waste impoundment (embankment or excavated type) to fresh water storage where the estimated volume of waste to be removed is approximately 75% liquid/slurry waste and 25% sludge/solid waste of the structural storage capacity of the structure. The purpose of the practice is to address resource concerns related to water quality degradation due to excess nutrient and pathogens in ground and/or surface waters and air quality impacts from greenhouse gases, particulate matter and associated precursors, and objectionable odors. Associated practices: Nutrient Management (590), Critical Area Planting (342)

Before Situation:

An existing lagoon or waste storage pond is no longer functioning correctly or is not being used for its intended purpose. It poses a safety hazard for humans and livestock and is a threat to environmental sustainability by the potential for impacts to water and air quality.

After Situation:

This scenario assumes a waste storage pond, with top dimensions of 110 ft x 110 ft, 8 ft total depth with 2:1 side slopes. The total structural storage volume equals 63,851 cubic feet. The volume of liquid waste to be pumped approximately equals 75% if the structural volume (75% X 63,851 CF = 47,888 CF). The volume of solid waste to be removed approximately equals 25% of the structural volume (25% X 63,851 = 15,963 CF). The volume of earthwork (earthfill and/or excavation) required to meet current NRCS standards and perform final grading and shaping of the site is approximately 5% of the structural volume. Structural removal, as necessary, may include the sealing or removal and disposal of waste transfer components and other appurtenances associated with closure of the facility. Conversion of a liquid waste storage impoundment for fresh water storage includes agitating, removing, and spreading liquid/slurry waste material, removing solid/sludge waste remaining in the bottom. All waste material shall be land applied in accordance with Nutrient Management (590). All inflow devices and associated appurtenances will be removed and properly disposed of. The embankment will be brought up to current NRCS standards for its intended purpose. The disturbed areas shall be vegetated in accordance with Critical Area Planting (342). Conversion to fresh water storage will address water quality degradation, air quality impacts and safety hazards by removing and properly utilizing the waste from the impoundment.

Feature Measure: Cubic feet of structural storage

Scenario Unit: Cubic Feet

Scenario Typical Size: 63,851.0

Scenario Total Cost: $9,931.21

Scenario Cost/Unit: $0.16

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	118	$494.42
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$100.83	8	$806.64
Manure, compost, injection	956	Loading, hauling and injecting manure/compost by ground equipment. Includes equipment, power unit and labor costs.	Gallons	$0.01	358204	$3,582.04
Spreading, manure sludge	1633	Loading, hauling and spreading manure solids/sludge by ground equipment on nearby fields. Includes equipment, power unit and labor costs.	Cubic Feet	$0.20	15963	$3,192.60
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	8	$193.52
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	8	$269.12
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	4	$942.84
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	1	$450.03

Practice: 360 - Waste Facility Closure

Scenario: #9 - Liquid Waste Impoundment Conversion to Fresh Water Storage with 50% Liquids and 50% Solids

Scenario Description:

This practice scenario includes the conversion of an earthen liquid waste impoundment (embankment or excavated type) to fresh water storage where the estimated volume of waste to be removed is approximately 50% liquid/slurry waste and 50% sludge/solid waste of the structural storage capacity of the structure. The purpose of the practice is to address resource concerns related to water quality degradation due to excess nutrient and pathogens in ground and/or surface waters and air quality impacts from greenhouse gases, particulate matter and associated precursors, and objectionable odors. Associated practices: Nutrient Management (590), Critical Area Planting (342)

Before Situation:

An existing lagoon or waste storage pond is no longer functioning correctly or is not being used for its intended purpose. It poses a safety hazard for humans and livestock and is a threat to environmental sustainability by the potential for impacts to water and air quality.

After Situation:

This scenario assumes a waste storage pond, with top dimensions of 110 ft x 110 ft, 8 ft total depth with 2:1 side slopes. The total structural storage volume equals 63,851 cubic feet. The volume of liquid waste to be pumped approximately equals 50% of the structural volume (50% X 63,851 CF = 31,925 CF). The volume of solid waste to be removed approximately equals 50% of the structural volume (50% X 63,851 = 31,925 CF). The volume of earthwork (earthfill and/or excavation) required to meet current NRCS standards and perform final grading and shaping of the site is approximately 5% of the structural volume. Structural removal, as necessary, may include the sealing or removal and disposal of waste transfer components and other appurtenances associated with closure of the facility. Conversion of a liquid waste storage impoundment for fresh water storage includes agitating, removing, and spreading liquid/slurry waste material, removing solid/sludge waste remaining in the bottom. All waste material shall be land applied in accordance with Nutrient Management (590). All inflow devices and associated appurtenances will be removed and properly disposed of. The embankment will be brought up to current NRCS standards for its intended purpose. The disturbed areas shall be vegetated in accordance with Critical Area Planting (342). Conversion to fresh water storage will address water quality degradation, air quality impacts and safety hazards by removing and properly utilizing the waste from the impoundment.

Feature Measure: Cubic feet of structural storage

Scenario Unit: Cubic Feet

Scenario Typical Size: 63,851.0

Scenario Total Cost: $11,929.60

Scenario Cost/Unit: $0.19

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	118	$494.42
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$100.83	8	$806.64
Manure, compost, injection	956	Loading, hauling and injecting manure/compost by ground equipment. Includes equipment, power unit and labor costs.	Gallons	$0.01	238803	$2,388.03
Spreading, manure sludge	1633	Loading, hauling and spreading manure solids/sludge by ground equipment on nearby fields. Includes equipment, power unit and labor costs.	Cubic Feet	$0.20	31925	$6,385.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	8	$193.52
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	8	$269.12
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	4	$942.84
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	1	$450.03

Practice: 360 - Waste Facility Closure

Scenario: #10 - Liquid Waste Impoundment Conversion to Fresh Water Storage with 25% Liquids and 75% Solids

Scenario Description:

This practice scenario includes the conversion of an earthen liquid waste impoundment (embankment or excavated type) to fresh water storage where the estimated volume of waste to be removed is approximately 25% liquid/slurry waste and 75% sludge/solid waste of the structural storage capacity of the structure. The purpose of the practice is to address resource concerns related to water quality degradation due to excess nutrient and pathogens in ground and/or surface waters and air quality impacts from greenhouse gases, particulate matter and associated precursors, and objectionable odors. Associated practices: Nutrient Management (590), Critical Area Planting (342)

Before Situation:

An existing lagoon or waste storage pond is no longer functioning correctly or is not being used for its intended purpose. It poses a safety hazard for humans and livestock and is a threat to environmental sustainability by the potential for impacts to water and air quality.

After Situation:

This scenario assumes a waste storage pond, with top dimensions of 110 ft x 110 ft, 8 ft total depth with 2:1 side slopes. The total structural storage volume equals 63,851 cubic feet. The volume of liquid waste to be pumped approximately equals 25% of the structural volume (25% X 63,851 CF = 15,963 CF). The volume of solid waste to be removed approximately equals 75% of the structural volume (75% X 63,851 = 47,888 CF). The volume of earthwork (earthfill and/or excavation) required to meet current NRCS standards and perform final grading and shaping of the site is approximately 5% of the structural volume. Structural removal, as necessary, may include the sealing or removal and disposal of waste transfer components and other appurtenances associated with closure of the facility. Conversion of a liquid waste storage impoundment for fresh water storage includes agitating, removing, and spreading liquid/slurry waste material, removing solid/sludge waste remaining in the bottom. All waste material shall be land applied in accordance with Nutrient Management (590). All inflow devices and associated appurtenances will be removed and properly disposed of. The embankment will be brought up to current NRCS standards for its intended purpose. The disturbed areas shall be vegetated in accordance with Critical Area Planting (342). Conversion to fresh water storage will address water quality degradation, air quality impacts and safety hazards by removing and properly utilizing the waste from the impoundment.

Feature Measure: Cubic feet of structural storage

Scenario Unit: Cubic Feet

Scenario Typical Size: 63,851.0

Scenario Total Cost: $13,928.18

Scenario Cost/Unit: $0.22

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	118	$494.42
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$100.83	8	$806.64
Manure, compost, injection	956	Loading, hauling and injecting manure/compost by ground equipment. Includes equipment, power unit and labor costs.	Gallons	$0.01	119401	$1,194.01
Spreading, manure sludge	1633	Loading, hauling and spreading manure solids/sludge by ground equipment on nearby fields. Includes equipment, power unit and labor costs.	Cubic Feet	$0.20	47888	$9,577.60
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	8	$193.52
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	8	$269.12
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	4	$942.84
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	1	$450.03

Practice: 360 - Waste Facility Closure

Scenario: #11 - Liquid Waste Impoundment Conversion to Fresh Water Storage with 0% Liquids and 100% Solids

Scenario Description:

This practice scenario includes the conversion of an earthen liquid waste impoundment (embankment or excavated type) to fresh water storage where the estimated volume of waste to be removed is approximately 0% liquid/slurry waste and 100% sludge/solid waste of the structural storage capacity of the structure. The purpose of the practice is to address resource concerns related to water quality degradation due to excess nutrient and pathogens in ground and/or surface waters and air quality impacts from greenhouse gases, particulate matter and associated precursors, and objectionable odors. Associated practices: Nutrient Management (590), Critical Area Planting (342)

Before Situation:

An existing lagoon or waste storage pond is no longer functioning correctly or is not being used for its intended purpose. It poses a safety hazard for humans and livestock and is a threat to environmental sustainability by the potential for impacts to water and air quality.

After Situation:

This scenario assumes a waste storage pond, with top dimensions of 110 ft x 110 ft, 8 ft total depth with 2:1 side slopes. The total structural storage volume equals 63,851 cubic feet. The volume of liquid waste to be pumped approximately equals 0% of the structural volume. The volume of solid waste to be removed approximately equals 100% of the structural volume (47,888 CF). The volume of earthwork (earthfill and/or excavation) required to meet current NRCS standards and perform final grading and shaping of the site is approximately 5% of the structural volume. Structural removal, as necessary, may include the sealing or removal and disposal of waste transfer components and other appurtenances associated with closure of the facility. Conversion of a liquid waste storage impoundment for fresh water storage includes agitating, removing, and spreading liquid/slurry waste material, removing solid/sludge waste remaining in the bottom. All waste material shall be land applied in accordance with Nutrient Management (590). All inflow devices and associated appurtenances will be removed and properly disposed of. The embankment will be brought up to current NRCS standards for its intended purpose. The disturbed areas shall be vegetated in accordance with Critical Area Planting (342). Conversion to fresh water storage will address water quality degradation, air quality impacts and safety hazards by removing and properly utilizing the waste from the impoundment.

Feature Measure: Cubic feet of structural storage

Scenario Unit: Cubic Feet

Scenario Typical Size: 63,851.0

Scenario Total Cost: $15,691.06

Scenario Cost/Unit: $0.25

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	118	$494.42
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$100.83	8	$806.64
Spreading, manure sludge	1633	Loading, hauling and spreading manure solids/sludge by ground equipment on nearby fields. Includes equipment, power unit and labor costs.	Cubic Feet	$0.20	63851	$12,770.20
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	8	$193.52
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	8	$269.12
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	3	$707.13
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	1	$450.03

Practice: 362 - Diversion

Scenario: #1 - Diversion

Scenario Description:

An earthen channel and ridge constructed across long slopes, to divert runoff away from farmsteads, agricultural waste systems, gullies, critical erosion areas, construction areas or other sensitive areas. Outlet may be waterway, underground outlet. or other suitable outlet. Typical diversion is 1000 feet long installed on a field slope of 1-3 percent, requiring 1 CY excavation per LF. Channel may be level or gradient, and the ridge may be vegetated or farmed. The quantity of excavation and fill is balanced.

Before Situation:

Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds "T" from farm fields and other locations. Also may be associated with animal feeding operations, with surface or roof runoff to be diverted from potential contamination sources, or contaminated water needing diverted to storage or treatment structures.

After Situation:

Diversion is installed using a dozer, scraper, or other earth-moving equipment. Field system meets "T", contaminated water or "clean" storm water runoff is diverted away from a contamination source to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Underground Outlet (620), Mulching (484), and Subsurface Drain (606).

Feature Measure: Diversion Fill Volume

Scenario Unit: Cubic Yards

Scenario Typical Size: 1,000.0

Scenario Total Cost: $1,990.03

Scenario Cost/Unit: $1.99

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, common earth, large equipment, 50 ft	1222	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yards	$1.54	1000	$1,540.00
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	1	$450.03

Practice: 366 - Anaerobic Digester

Scenario: #1 - Anaerobic Digester

Scenario Description:

An anaerobic digester can be part of a waste management system. It provides biological treatment of the waste in the absence of oxygen. This process for manure and other by-products of animal agricultural operations will manage odors, reduce the net effect of greenhouse gas emissions, and/or reduce pathogens. This scenario is for a generic anaerobic digester. Energy generation is not included with this scenario. Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Waste Separation Facility (632), Waste Treatment Lagoon (359), and Waste Storage Facility (313).

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and ground waters, in addition to the use of excessive amounts of fertilizers. The treatment of manure and other agricultural by-products is desired in order to manage odors, and/or reduce pathogens.

After Situation:

Manure and other agricultural by-products are being treated such that odors are managed and/or pathogens are reduced. Effluent from the digester is disposed of or utilized in a proper manner in accordance with a nutrient management plan. The typical scenario also includes items necessary to maintain mesophylic or thermophylic temperatures for bacterial activity (i.e. piping and boiler or other heat source). Typical Design Scenario is each.

Feature Measure: Each

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $1,250,969.33

Scenario Cost/Unit: $1,250,969.33

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$109.25	2	$218.50
Equipment Installation						
Anaerobic Digester	2478	Concrete anaerobic digester which includes poured walls, floor and top, reception and mixing tanks, piping installed in and/or around the digester for circulating heated liquid to maintain the necessary temperatures for efficient digester operation, piping and collection system for biogas, controls for operating digester and boiler system, boiler needed to maintain digester temperature, and flare excess gas to convert from methane to carbon dioxide. Includes material, labor, and equipment.	Each	$1,250,000.00	1	$1,250,000.00
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	1	$65.09
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	1	$450.03

Practice: 366 - Anaerobic Digester

Scenario: #7 - Covered Lagoon/Holding Pond

Scenario Description:

A covered lagoon can be part of a waste management system. It provides biological treatment of the waste in the absence of oxygen. This process for manure and other byproducts of animal agricultural operations will manage odors, reduce the net effect of greenhouse gas emissions, and/or reduce pathogens. This scenario is for all livestock operation sizes. The waste holding/treatment area is covered by waste treatment lagoon (359) or waste storage facility (313) and the cover is addressed under roofs and covers (367). Selection of digester type will be based on effluent consistency. Costs for this scenario are only for system controls, gas collection, and flaring system. Energy generation is not included with this scenario. Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Waste Separation Facility (632), Waste Treatment Lagoon (359), and Waste Storage Facility (313).

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This situation poses an environmentally threat of excessive nutrients, organics, and pathogens being transported into surface and ground waters, in addition to the use of excessive amounts of fertilizers. The treatment of manure and other agricultural by-products is desired in order to manage odors, and/or reduce pathogens.

After Situation:

Manure and other agricultural by-products are being treated such that odors are managed and/or pathogens are reduced. Effluent from the digester is disposed of or utilized in a proper manner in accordance with a nutrient management plan. A covered lagoon/holding pond typically has a fexible top installed over an earthen storage/treatment facility for the purpose of capturing the biogas. Typical Design Scenario: 1,000 animal units (715 - 1,400 lbs dairy cows).

Feature Measure: Animals Units Contributing to Diges

Scenario Unit: Animal Unit

Scenario Typical Size: 1,000.0

Scenario Total Cost: $270,529.96

Scenario Cost/Unit: $270.53

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$109.25	1	$109.25
Materials						
Covered Lagoon Gas Collection System	1664	Piping and collection system for biogas. Includes labor and equipment.	Each	$252,118.64	1	$252,118.64
Covered Lagoon Flare	1666	Flare excess gas to convert from methane to carbon dioxide. Includes labor and equipment.	Each	$18,001.27	1	$18,001.27
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	1	$65.09
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 367 - Roofs and Covers

Scenario: #1 - Flexible Roof

Scenario Description:

A flexible membrane or fabric-like roof placed on a steel truss hoop-like supports and supporting foundation. Manure is stored as a liquid in basins, tanks, and as a solid on concrete and earthen surfaces. Excess precipitation can cause premature filling of storages or cause nutrients to leach from solid manure piles leading to uncontrolled runoff as well as odor issues. Associated practices include Waste Storage Facility (313), Animal Mortality Facility (316), Composting Facility (317), Roof Runoff Structure (558), and Waste Treatment (629).

Before Situation:

Applicable where the exclusion of precipitation from an animal waste storage and/or treatment facility will improve of an existing or planned system. Manure is stored as a liquid in basins, tanks, and as a solid on concrete and earthen surfaces. Excess precipitation can cause premature filling of storages or cause nutrients to leach from solid manure piles leading to uncontrolled runoff as well as odor issues.

After Situation:

A flexible membrane or fabric-like roof placed on a steel truss hoop-like supports and supporting foundation. Roof or cover will be engineered and installed in accordance with appropriate building codes and permits. Typical size is 1,000 square feet and is over an approved animal waste management facility as a component of a CNMP. It is designed to prevent precipitation to allow proper management of animal waste streams (manure or compost streams), thus mitigating the negative factors from the "before practice implementation".

Feature Measure: Footprint of the building

Scenario Unit: Square Feet

Scenario Typical Size: 1,000.0

Scenario Total Cost: $8,391.60

Scenario Cost/Unit: $8.39

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Materials						
Roof, Hoop Truss Arch Structure, less than 30' wide	1667	Hoop Truss Arch Structure with fabric cover - less than 30' width, includes materials, equipment, and installation. Does not include foundation preparation.	Square Feet	$7.79	1000	$7,790.00
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	2	$130.18
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 367 - Roofs and Covers

Scenario: #2 - Timber or Steel Sheet Roof

Scenario Description:

A timber framed building with a timber or steel "sheet" roof and supporting foundation. Manure is stored as a liquid in basins, tanks, and as a solid on concrete and earthen surfaces. Excess precipitation can cause premature filling of storages or cause nutrients to leach from solid manure piles leading to uncontrolled runoff as well as odor issues. Associated practices include Waste Storage Facility (313), Animal Mortality Facility (316), Composting Facility (317), Agrichemical Handling Facility (309), Roof Runoff Structure (558), and Waste Treatment (629).

Before Situation:

Applicable where the exclusion of precipitation from an animal waste storage and/or treatment facility will improve of an existing or planned system. Manure is stored as a liquid in basins, tanks, and as a solid on concrete and earthen surfaces. Excess precipitation can cause premature filling of storages or cause nutrients to leach from solid manure piles leading to uncontrolled runoff as well as odor issues. Excess precipitation can cause premature filling of tanks and cause chemicals to contaminate runoff.

After Situation:

A timber framed building with a timber or steel "sheet" roof and supporting foundation. Engineered and installed in accordance with appropriate building codes and permits. Typical size is 1,000 square feet and is over an approved storage or treatment facility. It is designed to prevent precipitation from allowing proper management of animal waste (solid or liquid manure or compost) or chemical contamination of surface and ground water; Thus mitigating the negative factors of added precipitation from the "before practice situation.

Feature Measure: Footprint of building

Scenario Unit: Square Feet

Scenario Typical Size: 1,000.0

Scenario Total Cost: $12,365.89

Scenario Cost/Unit: $12.37

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Materials						
Roof, Post Frame Building , less than 30' wide	1672	Post Frame Building, no sides, - less than 30' width. Building sites with expected snow loads up to 30 lbs per square foot and wind exposure in semi protected areas (wooded or terrain with numerous closely spaced obstructions). Includes materials, shipping, equipment, and installation. Does not include foundation preparation.	Square Feet	$12.00	1000	$12,000.00
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	2	$130.18
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 367 - Roofs and Covers

Scenario: #3 - Steel Frame and Roof

Scenario Description:

A steel framed building with steel "sheet" roof and supporting foundation. Manure is stored as a liquid in basins, tanks, and as a solid on concrete and earthen surfaces. Excess precipitation can cause premature filling of storages or cause nutrients to leach from solid manure piles leading to uncontrolled runoff as well as odor issues. Associated practices includes Waste Storage Facility (313), Animal Mortality Facility (316), Composting Facility (317), Roof Runoff Structure (558), Waste Treatment (629) and (309) Agrichemical Handling Facility.

Before Situation:

Applicable where the exclusion of precipitation from an animal waste storage and/or treatment facility will improve of an existing or planned system. Manure is stored as a liquid in basins, tanks, and as a solid on concrete and earthen surfaces. Excess precipitation can cause premature filling of storages or cause nutrients to leach from solid manure piles leading to uncontrolled runoff as well as odor issues. Excess precipitation can cause premature filling of tanks and cause chemicals to contaminate runoff.

After Situation:

A steel framed building with steel "sheet" roof and supporting foundation. Engineered and installed in accordance with appropriate building codes and permits. Typical size is 10,010 square feet and is over an approved storage or treatment facility. It is designed to prevent precipitation from allowing proper management of animal waste (solid or liquid manure or compost) or chemical contamination of surface and ground water; Thus mitigating the negative factors of added precipitation from the "before practice situation

Feature Measure: Footprint of building

Scenario Unit: Square Feet

Scenario Typical Size: 10,010.0

Scenario Total Cost: $75,376.30

Scenario Cost/Unit: $7.53

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Materials						
Roof, Steel Frame Monoslope Building, greater than 60' wide	1677	Steel Frame Monoslope Building, greater than 60' width, includes materials, equipment, and installation. Does not include foundation preparation.	Square Feet	$7.47	10010	$74,774.70
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	2	$130.18
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 367 - Roofs and Covers

Scenario: #4 - Flexible Membrane Cover

Scenario Description:

A fabricated rigid, semi-rigid, or flexible membrane over a waste storage or treatment facility. The membrane will cover the entire surface of a waste storage or treatment facility (e.g. waste treatment lagoon or anaerobic digester). Cover will exclude precipitation and/or capture biogas for controlled release for flaring or anaerobic digestion. Associated practices include Waste Storage Facility (313), Waste Treatment Lagoon (359), Anaerobic Digester (366), Animal Mortality Facility (316), Composting Facility (317), Roof Runoff Structure (558), Pumping Plant (533), and Waste Treatment (629).

Before Situation:

Applicable where the exclusion of precipitation from an animal waste storage or treatment lagoon will improve the management of an existing or planned system, capture and controlled release or flaring of emissions from an existing or planned agricultural waste storage to improve air quality, and/or biogas production and capture for energy use are part of the existing or planned animal waste management system.

After Situation:

A fabricated rigid, semi-rigid, or flexible membrane over a waste storage or treatment facility. The membrane will cover the entire surface of a waste storage or treatment facility (e.g. waste treatment lagoon or anaerobic digester).

Feature Measure: Surface of Membrane

Scenario Unit: Square Feet

Scenario Typical Size: 10,000.0

Scenario Total Cost: $81,836.75

Scenario Cost/Unit: $8.18

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$5.40	40	$216.00
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.72	20	$1,014.40
Track Loader, 95HP	935	Equipment and power unit costs. Labor not included.	Hours	$83.63	16	$1,338.08
Trencher, 8 in.	936	Equipment and power unit costs. Labor not included.	Hours	$43.98	8	$351.84
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	16	$545.92
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	32	$774.08
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	28	$740.88
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	16	$538.24
Materials						
Synthetic Liner, 40 mil	1387	Synthetic 40 mil HDPE, LLDPE, EPDM, etc membrane liner material. Includes materials and shipping only.	Square Yard	$6.29	12000	$75,480.00
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	2	$130.18
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	3	$707.13

Practice: 367 - Roofs and Covers

Scenario: #5 - Flexible Membrane Cover with Flare

Scenario Description:

A fabricated flexible membrane over a waste storage or treatment facility. The membrane will cover the entire surface of a waste storage or treatment facility (e.g. waste treatment lagoon or anaerobic digester). Cover will exclude precipitation and/or capture biogas for controlled release for flaring or anaerobic digestion. This scenario includes the gas collection and flare system to convert methane to carbon dioxide. Associated practices include Waste Storage Facility (313), Waste Treatment Lagoon (359), Anaerobic Digester (366), Animal Mortality Facility (316), Composting Facility (317), Roof Runoff Structure (558), Pumping Plant (533), and Waste Treatment (629).

Before Situation:

Applicable where the exclusion of precipitation from an animal waste storage or treatment lagoon will improve the management of an existing or planned system, capture and controlled release or flaring of emissions from an existing or planned agricultural waste storage to improve air quality, and/or biogas production and capture for energy use are part of the existing or planned animal waste management system.

After Situation:

A fabricated flexible membrane over a 200 ft x 300 ft waste storage pond. The membrane will cover the entire surface of a waste storage or treatment facility (e.g. waste storage pond, waste treatment lagoon or anaerobic digester). A flare is included to burn off the captured emitted methane. Methane collection system under the cover is installed on a per acre rate basis.

Feature Measure: Surface of Membrane

Scenario Unit: Square Feet

Scenario Typical Size: 60,000.0

Scenario Total Cost: $839,615.16

Scenario Cost/Unit: $13.99

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$5.40	100	$540.00
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.72	56	$2,840.32
Track Loader, 95HP	935	Equipment and power unit costs. Labor not included.	Hours	$83.63	40	$3,345.20
Trencher, 8 in.	936	Equipment and power unit costs. Labor not included.	Hours	$43.98	24	$1,055.52
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	40	$1,364.80
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	96	$2,322.24
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	80	$2,116.80
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	40	$1,345.60
Materials						
Synthetic Liner, 40 mil	1387	Synthetic 40 mil HDPE, LLDPE, EPDM, etc membrane liner material. Includes materials and shipping only.	Square Yard	$6.29	72000	$452,880.00
Covered Lagoon Gas Collection System	1664	Piping and collection system for biogas. Includes labor and equipment.	Each	$252,118.64	1.4	$352,966.10
Covered Lagoon Flare	1666	Flare excess gas to convert from methane to carbon dioxide. Includes labor and equipment.	Each	$18,001.27	1	$18,001.27
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	2	$130.18
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	3	$707.13

Practice: 367 - Roofs and Covers

Scenario: #6 - Permeable Composite or Inorganic Cover

Scenario Description:

A permeable floating composite cover is deployed on the liquid surface of a waste storage or treatment facility. Permeable covers reduce radiation and wind velocity over the surface of a liquid storage to reduce transmission of odors and act as a medium for growth of microorganisms that utilize carbon, nitrogen, and sulfur to decompose odorous compounds. The permeable composite cover utilizes fabricated shapes or tiles that fit together to cover a minimum of 90% of the liquid surface of a waste storage facility. Associated practices include Waste Storage Facility (313), and Waste Treatment Lagoon (359)

Before Situation:

Applicable where an existing or planned animal waste storage or treatment lagoon is creating significant air quality concerns due to odor problems and the release of ammonia as a fine particulate matter precursor. Installation will improve the management of an existing or planned system to control the release of odors as well as ammonia to improve air quality as part of the existing or planned animal waste management system.

After Situation:

A permeable modular cover applied to the liquid surface of a waste storage or treatment facility. Installation of the permeable modular cover will improve air quality by reducing emissions of odors and ammonia. The waste storage volume must be documented in the CNMP as adequate to store the waste product and rainfall on the surface of the facility for the intended period without any credit for evaporative loss. Installation of the practice will address air quality by reducing emissions of odors and ammonia. The typical waste storage structure has a liquid surface area of 7,000 square feet.

Feature Measure: Storage Surface Area at Normal Full

Scenario Unit: Square Feet

Scenario Typical Size: 7,000.0

Scenario Total Cost: $21,125.06

Scenario Cost/Unit: $3.02

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$46.88	2	$93.76
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	2	$48.38
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	2	$52.92
Materials						
Composite Cover, floating cover, > 5,000 square feet	1860	Composite material that is used to cover open storages with an area greater than 5,000 sf. Example, Hexa-Cover. Materials only.	Square Feet	$2.99	7000	$20,930.00

Practice: 368 - Emergency Animal Mortality Management

Scenario: #37 - In-House Composting

Scenario Description:

This scenario consists the emergency disposal of poultry mortality by composting in a static windrow. The cause of mortatiy is an event not related to disease. Additional carbon based bulking material is added to facilitate aeration and provide a proper C:N ratio. The windrow is turned at least once to go into another heat cycle prior to land application. Access is infrequent. This option may not be desirable for sites with limited area, karst topography, and not isolated from of public view. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Pond Sealing or Lining, Bentonite Sealant (521C), Pond Sealing or Lining, Compacted Clay Treatment (521D), Pond Sealing or Lining, Soil Dispersant (521B), Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Diversion (362).

Before Situation:

Animal mortality is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from incomplete composting, or interaction with predators. No plan was formulated for catastrophic mortality events.

After Situation:

Animal mortality is being done in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, complete composting, and protection from predators to minimize pathogen survival or spreading. An overall plan covers normal and catastrophic mortality events. The typical scenario number of birds to be disposed of is 20,000, 4 pound birds which can be composted in-house. Composting requires 1.5 pounds of carbon per pound of bird. There is 0.5 pounds of litter per bird already on site. Wood chips (45 pcf) will be used as the additional carbon source. The composting windrow construction operation consists of 2 pieces of equipment and 2 add'l laborers: 1) stockpiling birds and litter in center of house; 2) construct 2 windrow bases using carbon material; 3) place carcass/litter mix on bases; 4) cover with carbon material; 5) cap windrows with any remaining litter; 6) after first heat cycle remove windrow from house and reconstruct outside house for finishing. Site to be located out of drainage areas, off-site water diverted and any runoff to spread out into a grassed area.

Feature Measure: Number of 1000 lbs Animal Units

Scenario Unit: Animal Unit

Scenario Typical Size: 80.0

Scenario Total Cost: $8,047.96

Scenario Cost/Unit: $100.60

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.72	28	$1,420.16
Aggregate, Wood Chips	1098	Includes materials, equipment and labor	Cubic Yards	$50.28	91	$4,575.48
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	28	$677.32
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	28	$740.88
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	4	$634.12

Practice: 368 - Emergency Animal Mortality Management

Scenario: #38 - Burial

Scenario Description:

This scenario consists of the on-site burial of animal mortalities resulting from catastrophic events not related to disease. An earthen pit is excavated to contain the mortalities, and earth cover is placed over the mortalities to provide protection from predators to minimize pathogen survival or spreading. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Pond Sealing or Lining, Bentonite Sealant (521C), Pond Sealing or Lining, Compacted Clay Treatment (521D), Pond Sealing or Lining, Soil Dispersant (521B), Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), and Diversion (362).

Before Situation:

Animal mortality disposal is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from incomplete composting, incineration, or interaction with predators. No plan was formulated for catastrophic mortality events.

After Situation:

Catastrophic Animal mortalities resulting from causes not related to disease are being disposed in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, and protection from predators to minimize pathogen survival or spreading. An overall plan covers the burial of animals as a result of catastrophic mortality events. This typical scenario was developed based on the disposal of 25 head of mature cattle located near the area where the cattle have been found. The scenario includes equipment time and labor to recover and transport carcasses to the burial location. The scenario also includes a burial trench 4' deep plus 3' additional cover over carcasses. Construct a 6' x 60' (surface dimensions) burial site with appropriate cover. Site can handle mortality for 25 mature beef cattle. On site soils can be re-compacted to meet required imperviousness. Include 3' overfill or mounding excavated material to provide for settlement of the burial site and divert or minimize offsite runoff. Site to be located out of drainage areas, off-site water diverted and any runoff to spread out into a grassed area.

Feature Measure: Number of 1000 lbs Animal Units

Scenario Unit: Animal Unit

Scenario Typical Size: 25.0

Scenario Total Cost: $2,322.34

Scenario Cost/Unit: $92.89

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.42	94	$321.48
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$46.88	12	$562.56
Excavation, common earth, large equipment, 50 ft	1222	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yards	$1.54	94	$144.76
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	12	$290.28
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	12	$317.52
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	1	$450.03

Practice: 368 - Emergency Animal Mortality Management

Scenario: #39 - Burial of Cattle or Horses

Scenario Description:

This scenario consists of the on-site burial of cattle or horse mortalities resulting from catastrophic events not related to disease. An earthen pit is excavated to contain the mortalities, and earth cover is placed over the mortalities to provide protection from predators to minimize pathogen survival or spreading. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Pond Sealing or Lining, Bentonite Sealant (521C), Pond Sealing or Lining, Compacted Clay Treatment (521D), Pond Sealing or Lining, Soil Dispersant (521B), Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), and Diversion (362).

Before Situation:

Animal mortality disposal is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from incomplete composting, incineration, or interaction with predators.

After Situation:

Catastrophic Animal mortalities resulting from causes not related to disease are being disposed in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, and protection from predators to minimize pathogen survival or spreading. An overall plan covers the burial of animals as a result of catastrophic mortality events. This typical scenario was developed based on the disposal of 5 head averaging 1000 pounds each located near the area where the cattle have been found. The scenario includes equipment time and labor to recover and transport carcasses to the burial location. The scenario also includes a burial trench 4' deep plus 2' additional cover over carcasses. Construct a 16'W x 32'L (surface dimensions) burial site with appropriate cover. On site soils can be recompacted to meet required imperviousness. Include 2' overfill or mounding excavated material to provide for settlement of the burial site and divert or minimize offsite runoff. Site to be located out of drainage areas, off-site water diverted and any runoff to spread out into a grassed area.

Feature Measure: Number of head

Scenario Unit: Each

Scenario Typical Size: 5.0

Scenario Total Cost: $1,923.82

Scenario Cost/Unit: $384.76

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.42	78	$266.76
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$46.88	5	$234.40
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	10	$241.90
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	5	$132.30
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	8	$362.72
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	1	$450.03

Practice: 368 - Emergency Animal Mortality Management

Scenario: #40 - Burial of Swine

Scenario Description:

This scenario consists of the on-site burial of swine or other similarly sized animal mortalities on a small size operation resulting from catastrophic events not related to disease. An earthen pit is excavated to contain the mortalities, and earth cover is placed over the mortalities to provide protection from predators to minimize pathogen survival or spreading. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Pond Sealing or Lining, Bentonite Sealant (521C), Pond Sealing or Lining, Compacted Clay Treatment (521D), Pond Sealing or Lining, Soil Dispersant (521B), Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), and Diversion (362).

Before Situation:

Animal mortality disposal is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from incomplete composting, incineration, or interaction with predators.

After Situation:

Catastrophic Animal mortalities resulting from causes not related to disease are being disposed in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, and protection from predators to minimize pathogen survival or spreading. An overall plan covers the burial of animals as a result of catastrophic mortality events. This typical scenario was developed based on the burial of 1 boar at 450 pounds, 9 sows at 350 pounds each and 8 babies/sow at 12 pounds each in a landfill. The number of head counted are the sows and boar (adult swine) at 10 total head. The scenario includes equipment time and labor to recover and transport carcasses to the burial location. The scenario also includes a burial trench 4' deep plus 2' additional cover over carcasses. Construct a 16'W x 52'L (surface dimensions) burial site with appropriate cover. On site soils can be recompacted to meet required imperviousness. Include 2' overfill or mounding excavated material to provide for settlement of the burial site and divert or minimize offsite runoff. Site to be located out of drainage areas, off-site water diverted and any runoff to spread out into a grassed area.

Feature Measure: Number of Adult Head

Scenario Unit: Each

Scenario Typical Size: 10.0

Scenario Total Cost: $1,651.30

Scenario Cost/Unit: $165.13

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.42	78	$266.76
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$46.88	3	$140.64
Excavation, common earth, large equipment, 50 ft	1222	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yards	$1.54	40	$61.60
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	6	$145.14
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	3	$79.38
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	6	$272.04
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	1	$450.03

Practice: 368 - Emergency Animal Mortality Management

Scenario: #41 - Burial of Goat or Sheep

Scenario Description:

This scenario consists of the on-site burial of goat, sheep or other similarly sized animal mortalities on a small size operation resulting from catastrophic events not related to disease. An earthen pit is excavated to contain the mortalities, and earth cover is placed over the mortalities to provide protection from predators to minimize pathogen survival or spreading. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Pond Sealing or Lining, Bentonite Sealant (521C), Pond Sealing or Lining, Compacted Clay Treatment (521D), Pond Sealing or Lining, Soil Dispersant (521B), Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), and Diversion (362).

Before Situation:

Animal mortality disposal is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from incomplete composting, incineration, or interaction with predators.

After Situation:

Catastrophic Animal mortalities resulting from causes not related to disease are being disposed in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, and protection from predators to minimize pathogen survival or spreading. An overall plan covers the burial of animals as a result of catastrophic mortality events. This typical scenario was developed based on the burial of 10 head of 100 pound average weight goats. The scenario includes equipment time and labor to recover and transport carcasses to the burial location. The scenario also includes a burial trench 3' deep plus 2' additional cover over carcasses. Construct a 12'W x 29'L (surface dimensions) burial site with appropriate cover. On site soils can be recompacted to meet required imperviousness. Include 2' overfill or mounding excavated material to provide for settlement of the burial site and divert or minimize offsite runoff. Site to be located out of drainage areas, off-site water diverted and any runoff to spread out into a grassed area.

Feature Measure: Number of Head

Scenario Unit: Each

Scenario Typical Size: 10.0

Scenario Total Cost: $1,323.84

Scenario Cost/Unit: $132.38

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.42	30	$102.60
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$46.88	2	$93.76
Excavation, common earth, large equipment, 50 ft	1222	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yards	$1.54	13	$20.02
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	4	$96.76
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	2	$52.92
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	6	$272.04
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	1	$450.03

Practice: 371 - Air Filtration and Scrubbing

Scenario: #7 - Biofilter-Traditional Horizontal

Scenario Description:

Porous filter media is utilized to filter the exhaust from animal confinement facilities to allow microbial activity to reduce objectionable odors. The typical installation is a horizontal media bed supported by a treated lumber substructure to allow airflow from multiple fans to be directed beneath and then up through the media. Vertical biofilters may also be utilized. The filter media is a combination of wood chips to maintain porosity and compost to provide the microorganisms for the air filtering activity. A typical mix ratio would be 80% wood chips and 20% compost. Ventilation system component alterations that may be required to facilitate the biofilter application are not included in the cost computation. Payment includes materials, equipment, and labor costs for installing the biofilter. A stabilized area around the biofilter is not included and must be addressed through the associated practice of Heavy Use Area Protection (561), if needed. Resource concern: Air – Objectionable Odors

Before Situation:

The animal confinement facility has an uncontrolled airflow that is causing objectionable odors.

After Situation:

A 32' X 200" horizontal media bed, 20" thick is supported by a treated lumber substructure to allow airflow to be directed beneath and then up through the media is installed adjacent to a swine production facility. Exhaust from the facility is directed to flow through the biofilter media to reduce objectionable odors. Maintainace of the media bed will be required on a 3-5 year cycle to maintain effectiveness. Associated practices include Heavy Use Area Protection (561), Amendments for Treatment of Agricultural Waste (591), Windbreak (380), Waste Storage Facility (313), Composting Facility (317), and CAP-Comprehensive Air Quality Management Plan (126).

Feature Measure: Biofilter Media Volume

Scenario Unit: Cubic Yards

Scenario Typical Size: 395.0

Scenario Total Cost: $14,836.37

Scenario Cost/Unit: $37.56

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$96.65	2	$193.30
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	24	$580.56
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	2	$67.28
Materials						
Compost	265	A mixture of decaying organic matter, as from leaves and manure, used to improve soil structure and provide nutrients.	Ton	$43.63	20	$872.60
Dimension Lumber, Treated	1044	Treated dimension lumber with nominal thickness equal or less than 2". Includes lumber and fasteners	Board Feet	$1.14	9550	$10,887.00
Post, Wood, Untreated, 8-9 inch dia. X 8 ft.	1078	Wood Post, End 8-9 inch diameter x 8 foot long, untreated. Includes materials and shipping only.	Each	$28.79	30	$863.70
Plywood, 3/4 inch, treated	2363	Treated 4' x 8' sheets of 3/4 inch exterior grade plywood	Each	$36.18	30	$1,085.40
Biofilter Media Netting	2640	UV stabilized, 3/4 inch polypropylene mesh. Materials and shipping only.	Square Feet	$0.02	6400	$128.00
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53

Practice: 371 - Air Filtration and Scrubbing

Scenario: #8 - Biofilter-Single Pit Fan

Scenario Description:

Establishment of a biofilter used to treat the air flow from a single waste pit ventilation fan in instances where control of the exhaust from all pit ventilation fans is not needed. Adequate moisture in the wood chip media is maintained for proper growth of bacteria. For each waste pit ventilation fan servicing a waste storage facility that is identified as exhausting odorous and/or particulate laden air into the atmosphere, a separate biofilter is installed. Payment includes materials, equipment, and labor costs for installing the biofilter. A stabilized area around the biofilter is not included and must be addressed through the associated practice of Heavy Use Area Protection (561), if needed.

Before Situation:

One or more pit ventilation fans of a manure storage facility on a Headquarters site are exhausting odorous and/or particulate laden air into the atmosphere.

After Situation:

Air Quality resource concerns are addressed through installation of the practice by reducing odors and/or particulate matter emissions. Exhaust from a 24” waste pit ventilation fan is piped to a 16’ wide by 20’ long by 4’ high horizontal biofilter constructed of a formed concrete bin that is filled with wood chip media, capable of handling 5,500 cubic feet per minute of airflow. The loading of odor and/or particulates into the air at the production facility is significantly reduced, resulting in a substantial improvement in air quality. Ammonia emissions are reduced approximately 60%; hydrogen sulfide about 80% and odor 60 to 80%. Associated practices include Heavy Use Area Protection (561), Amendments for Treatment of Agricultural Waste (591), Windbreak (380), Waste Storage Facility (313)and CAP-Comprehensive Air Quality Management Plan (126).

Feature Measure: Number of Biofilters Installed

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $18,011.01

Scenario Cost/Unit: $18,011.01

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$372.36	10	$3,723.60
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$494.40	11.3	$5,586.72
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	33	$68.64
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	8	$178.32
Aggregate, Wood Chips	1098	Includes materials, equipment and labor	Cubic Yards	$50.28	24	$1,206.72
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	2	$68.24
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	6	$145.14
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	11	$330.77
Pipe, PE, 3/4 in., DR 9	996	Materials: - 3/4 inch - PE - 160 psi - ASTM D3035 DR 9	Feet	$0.46	50	$23.00
Pump, <= 5 HP, pump and motor, fixed cost portion	1009	Fixed cost portion of a pump less than or equal to 5 HP pump and motor. This portion is a base cost and is not dependant on horsepower. The total cost of any pump will include this fixed cost plus a variable cost portion. The completed pump and motor will include the motor and controls. Includes material and shipping only.	Each	$1,019.47	1	$1,019.47
Pump, <= 5 HP, pump and motor, variable cost portion	1010	Variable cost portion of a pump less than or equal to 5 HP pump and motor. This portion IS dependent on the total horsepower for the pump. The total cost of any pump will include this variable cost plus the fixed cost portion. The completed pump and motor will include the motor and controls. Includes material and shipping only.	Horsepower	$353.92	0.25	$88.48
Dimension Lumber, Treated	1044	Treated dimension lumber with nominal thickness equal or less than 2". Includes lumber and fasteners	Board Feet	$1.14	80	$91.20

Switches and Controls, programmable controller	1193	Programmable logic controller (with or without wireless telecommunications) commonly used to control pumps and irrigation systems	Each	$307.65	1	$307.65
Geotextile, non-woven, light weight	1209	Non-woven less than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only.	Square Yard	$1.64	36	$59.04
Micro Irrigation, surface drip tubing	1488	Tubing is installed above ground for surface drip irrigation, includes installation, and connections to the supply and flushing laterals. Tubing has emitters built in.	Feet	$0.32	100	$32.00
Articulated precast concrete planking, 5 Foot Wide block	1906	Articulated precast concrete blocks with a typical thickness of 4.5 inches. Includes materials only.	Square Feet	$7.76	320	$2,483.20
Pipe, PVC, 24 in., SCH 40	2046	Materials: - 24 inch - PVC - SCH 40 - ASTM D1785	Feet	$59.38	40	$2,375.20
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	1	$65.09
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53

Practice: 372 - Combustion System Improvement

Scenario: #1 - IC Engine Repower, < 50 bhp

Scenario Description:

Replace an existing older diesel engine with a new diesel engine (<50 bhp) that is certified to the newest available U.S. EPA engine TIER rating. The existing diesel engine may be stationary or portable, but not mobile (i.e., providing motive power to tractors, trucks, etc.). Examples of stationary or portable engines include diesel-fired pumping plant power units (if the only change is replacing or repowering the power unit/engine – otherwise use CPS 533 – Pumping Plant), emergency generators, or engines providing power for other agricultural systems. Resource Concerns: Air Quality – Emissions of Particulate Matter (PM) and PM Precursors; Air Quality – Emissions of Ozone Precursors; Inefficient Energy Use – Equipment and Facilities; Inefficient Energy Use – Farming/Ranching Practices and Field Operations. Associated Practices include: 374 – Farmstead Energy Improvement; 533 – Pumping Plant; 430 – Irrigation Pipeline; 441 – Irrigation System, Microirrigation; 442 – Sprinkler System; 447 – Irrigation System, Tailwater Recovery; 449 – Irrigation Water Management; 516 – Livestock Pipeline; 313 – Waste Storage Facility; 634 – Waste Transfer; 642 – Water Well; and 614 – Watering Facility.

Before Situation:

An old or inefficient diesel engine provides power to an agricultural system, such as an irrigation pumping plant or grain dryer fan, or provides backup power generation for a farming operation. Air Quality Impacts: The existing internal combustion engine emissions are identified to contribute to an air quality resource concern. Inefficient Energy Use: The existing internal combustion engine uses excess fuel to provide power to an agricultural system.

After Situation:

The existing older diesel engine is replaced or repowered with a new diesel engine (<50 bhp) that is certified to the newest available U.S. EPA engine TIER rating. The engine being replaced or repowered will be destroyed or disabled and a certificate of destruction or inoperability submitted prior to certification of practice completion. The existing engine is supported by a concrete pad; no costs have been included for a new pad. Additional costs may be incurred if a concrete pad is not present. Air Quality Impacts: The replacement or repower diesel engine will be cleaner-burning and will emit less particulate matter and/or oxides of nitrogen than the previous existing engine. The decrease in emissions for the replacement or repower engine must be supported by calculations showing the expected emissions reductions. Inefficient Energy Use: Energy efficiency will be improved. The increase in energy efficiency for the replacement or repower engine must be supported by an energy analysis.

Feature Measure: Size of Replacement Engine

Scenario Unit: Brake Horse Power

Scenario Typical Size: 30.0

Scenario Total Cost: $2,830.76

Scenario Cost/Unit: $94.36

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	8	$272.96
Materials						
Motor, IC Engine, 25-49 HP	1428	Most current Tier-level Diesel or Cleaner Engine and required appurtenances. 25 to 49 bhp. Materials only.	Horsepower	$85.26	30	$2,557.80

Practice: 372 - Combustion System Improvement

Scenario: #2 - IC Engine Repower, 50-99 bhp

Scenario Description:

Replace an existing older diesel engine with a new diesel engine (50-99 bhp) that is certified to the newest available U.S. EPA engine TIER rating. The existing diesel engine may be stationary or portable, but not mobile (i.e., providing motive power to tractors, trucks, etc.). Examples of stationary or portable engines include diesel-fired pumping plant power units (if the only change is replacing or repowering the power unit/engine – otherwise use CPS 533 – Pumping Plant), emergency generators, or engines providing power for other agricultural systems. Resource Concerns: Air Quality – Emissions of Particulate Matter (PM) and PM Precursors; Air Quality – Emissions of Ozone Precursors; Inefficient Energy Use – Equipment and Facilities; Inefficient Energy Use – Farming/Ranching Practices and Field Operations. Associated Practices include: 374 – Farmstead Energy Improvement; 533 – Pumping Plant; 430 – Irrigation Pipeline; 441 – Irrigation System, Microirrigation; 442 – Sprinkler System; 447 – Irrigation System, Tailwater Recovery; 449 – Irrigation Water Management; 516 – Livestock Pipeline; 313 – Waste Storage Facility; 634 – Waste Transfer; 642 – Water Well; and 614 – Watering Facility.

Before Situation:

An old or inefficient diesel engine provides power to an agricultural system, such as an irrigation pumping plant or grain dryer fan, or provides backup power generation for a farming operation. Air Quality Impacts: The existing internal combustion engine emissions are identified to contribute to an air quality resource concern. Inefficient Energy Use: The existing internal combustion engine uses excess fuel to provide power to an agricultural system.

After Situation:

The existing older diesel engine is replaced or repowered with a new diesel engine (50-99 bhp) that is certified to the newest available U.S. EPA engine TIER rating. The engine being replaced or repowered will be destroyed or disabled and a certificate of destruction or inoperability submitted prior to certification of practice completion. The existing engine is supported by a concrete pad; no costs have been included for a new pad. Additional costs may be incurred if a concrete pad is not present. Air Quality Impacts: The replacement or repower diesel engine will be cleaner-burning and will emit less particulate matter and/or oxides of nitrogen than the previous existing engine. The decrease in emissions for the replacement or repower engine must be supported by calculations showing the expected emissions reductions. Inefficient Energy Use: Energy efficiency will be improved. The increase in energy efficiency for the replacement or repower engine must be supported by an energy analysis.

Feature Measure: Size of Replacement Engine

Scenario Unit: Brake Horse Power

Scenario Typical Size: 75.0

Scenario Total Cost: $14,603.92

Scenario Cost/Unit: $194.72

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	16	$545.92
Materials						
Motor, IC Engine, 50-99 HP	1429	Most current Tier-level Diesel or Cleaner Engine and required appurtenances. 50 to 99 bhp. Materials only.	Horsepower	$187.44	75	$14,058.00

Practice: 372 - Combustion System Improvement

Scenario: #3 - IC Engine Repower, 100-199 bhp

Scenario Description:

Replace an existing older diesel engine with a new diesel engine (100-199 bhp) that is certified to the newest available U.S. EPA engine TIER rating. The existing diesel engine may be stationary or portable, but not mobile (i.e., providing motive power to tractors, trucks, etc.). Examples of stationary or portable engines include diesel-fired pumping plant power units (if the only change is replacing or repowering the power unit/engine – otherwise use CPS 533 – Pumping Plant), emergency generators, or engines providing power for other agricultural systems. Resource Concerns: Air Quality – Emissions of Particulate Matter (PM) and PM Precursors; Air Quality – Emissions of Ozone Precursors; Inefficient Energy Use – Equipment and Facilities; Inefficient Energy Use – Farming/Ranching Practices and Field Operations. Associated Practices include: 374 – Farmstead Energy Improvement; 533 – Pumping Plant; 430 – Irrigation Pipeline; 441 – Irrigation System, Microirrigation; 442 – Sprinkler System; 447 – Irrigation System, Tailwater Recovery; 449 – Irrigation Water Management; 516 – Livestock Pipeline; 313 – Waste Storage Facility; 634 – Waste Transfer; 642 – Water Well; and 614 – Watering Facility.

Before Situation:

An old or inefficient diesel engine provides power to an agricultural system, such as an irrigation pumping plant or grain dryer fan, or provides backup power generation for a farming operation. Air Quality Impacts: The existing internal combustion engine emissions are identified to contribute to an air quality resource concern. Inefficient Energy Use: The existing internal combustion engine uses excess fuel to provide power to an agricultural system.

After Situation:

The existing older diesel engine is replaced or repowered with a new diesel engine (100-199 bhp) that is certified to the newest available U.S. EPA engine TIER rating. The engine being replaced or repowered will be destroyed or disabled and a certificate of destruction or inoperability submitted prior to certification of practice completion. The existing engine is supported by a concrete pad; no costs have been included for a new pad. Additional costs may be incurred if a concrete pad is not present. Air Quality Impacts: The replacement or repower diesel engine will be cleaner-burning and will emit less particulate matter and/or oxides of nitrogen than the previous existing engine. The decrease in emissions for the replacement or repower engine must be supported by calculations showing the expected emissions reductions. Inefficient Energy Use: Energy efficiency will be improved. The increase in energy efficiency for the replacement or repower engine must be supported by an energy analysis.

Feature Measure: Size of Replacement Engine

Scenario Unit: Brake Horse Power

Scenario Typical Size: 150.0

Scenario Total Cost: $21,739.42

Scenario Cost/Unit: $144.93

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	16	$545.92
Materials						
Motor, IC Engine, 100-199 HP	1430	Most current Tier-level Diesel or Cleaner Engine and required appurtenances. 100 to 199 bhp. Materials only.	Horsepower	$141.29	150	$21,193.50

Practice: 372 - Combustion System Improvement

Scenario: #4 - IC Engine Repower, >=200 bhp

Scenario Description:

Replace an existing older diesel engine with a new diesel engine (>=200 bhp) that is certified to the newest available U.S. EPA engine TIER rating. The existing diesel engine may be stationary or portable, but not mobile (i.e., providing motive power to tractors, trucks, etc.). Examples of stationary or portable engines include diesel-fired pumping plant power units (if the only change is replacing or repowering the power unit/engine – otherwise use CPS 533 – Pumping Plant), emergency generators, or engines providing power for other agricultural systems. Resource Concerns: Air Quality – Emissions of Particulate Matter (PM) and PM Precursors; Air Quality – Emissions of Ozone Precursors; Inefficient Energy Use – Equipment and Facilities; Inefficient Energy Use – Farming/Ranching Practices and Field Operations. Associated Practices include: 374 – Farmstead Energy Improvement; 533 – Pumping Plant; 430 – Irrigation Pipeline; 441 – Irrigation System, Microirrigation; 442 – Sprinkler System; 447 – Irrigation System, Tailwater Recovery; 449 – Irrigation Water Management; 516 – Livestock Pipeline; 313 – Waste Storage Facility; 634 – Waste Transfer; 642 – Water Well; and 614 – Watering Facility.

Before Situation:

An old or inefficient diesel engine provides power to an agricultural system, such as an irrigation pumping plant or grain dryer fan, or provides backup power generation for a farming operation. Air Quality Impacts: The existing internal combustion engine emissions are identified to contribute to an air quality resource concern. Inefficient Energy Use: The existing internal combustion engine uses excess fuel to provide power to an agricultural system.

After Situation:

The existing older diesel engine is replaced or repowered with a new diesel engine (>=200 bhp) that is certified to the newest available U.S. EPA engine TIER rating. The engine being replaced or repowered will be destroyed or disabled and a certificate of destruction or inoperability submitted prior to certification of practice completion. The existing engine is supported by a concrete pad; no costs have been included for a new pad. Additional costs may be incurred if a concrete pad is not present. Air Quality Impacts: The replacement or repower diesel engine will be cleaner-burning and will emit less particulate matter and/or oxides of nitrogen than the previous existing engine. The decrease in emissions for the replacement or repower engine must be supported by calculations showing the expected emissions reductions. Inefficient Energy Use: Energy efficiency will be improved. The increase in energy efficiency for the replacement or repower engine must be supported by an energy analysis.

Feature Measure: Size of Replacement Engine

Scenario Unit: Brake Horse Power

Scenario Typical Size: 350.0

Scenario Total Cost: $545.92

Scenario Cost/Unit: $1.56

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	16	$545.92
Materials						
Deactivated. Motor, IC Engine, 300-399 HP	1433	Most current Tier-level Diesel or Cleaner Engine and required appurtenances. 300 to 399 bhp. Materials only.	Horsepower	$0.00	350	$0.00

Practice: 372 - Combustion System Improvement

Scenario: #5 - Electric Motor in-lieu of IC Engine, < 12 HP

Scenario Description:

Replace an existing older diesel engine with a new electric motor (<12 hp). The existing diesel engine may be stationary or portable, but not mobile (i.e., providing motive power to tractors, trucks, etc.). Examples of stationary or portable engines include diesel-fired pumping plant power units (if the only change is replacing the power unit/engine – otherwise use CPS 533 – Pumping Plant), emergency generators, or engines providing power for other agricultural systems. Resource Concerns: Air Quality – Emissions of Particulate Matter (PM) and PM Precursors; Air Quality – Emissions of Ozone Precursors; Inefficient Energy Use – Equipment and Facilities; Inefficient Energy Use – Farming/Ranching Practices and Field Operations. Associated Practices include: 374 – Farmstead Energy Improvement; 533 – Pumping Plant; 430 – Irrigation Pipeline; 441 – Irrigation System, Microirrigation; 442 – Sprinkler System; 447 – Irrigation System, Tailwater Recovery; 449 – Irrigation Water Management; 516 – Livestock Pipeline; 313 – Waste Storage Facility; 634 – Waste Transfer; 642 – Water Well; and 614 – Watering Facility.

Before Situation:

An old or inefficient diesel engine provides power to an agricultural system, such as an irrigation pumping plant or grain dryer fan, or provides backup power generation for a farming operation. Air Quality Impacts: The existing internal combustion engine emissions are identified to contribute to an air quality resource concern. Inefficient Energy Use: The existing internal combustion engine uses excess fuel to provide power to an agricultural system.

After Situation:

The existing older diesel engine is replaced with a new electric motor (<12 hp). The engine being replaced or repowered will be destroyed or disabled and a certificate of destruction or inoperability submitted prior to certification of practice completion. The existing engine is supported by a concrete pad; no costs have been included for a new pad. Additional costs may be incurred if a concrete pad is not present. Air Quality Impacts: The new electric motor does not produce any on-farm emissions of particulate matter or oxides of nitrogen, resulting in a substantial emissions reduction on the farm. Inefficient Energy Use: Energy efficiency will be improved.

Feature Measure: Number of Combustion Units Repla

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $1,158.00

Scenario Cost/Unit: $1,158.00

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	8	$272.96
Materials						
Motor, electric, NEMA Premium, 10 HP	1172	Premium NEMA approved electric motor, 10 Horsepower and all required appurtenances. Includes materials and shipping only.	Each	$885.04	1	$885.04

Practice: 372 - Combustion System Improvement

Scenario: #6 - Electric Motor in-lieu of IC Engine, 12-74 HP

Scenario Description:

Replace an existing older diesel engine with a new electric motor (12-74 hp). The existing diesel engine may be stationary or portable, but not mobile (i.e., providing motive power to tractors, trucks, etc.). Examples of stationary or portable engines include diesel-fired pumping plant power units (if the only change is replacing the power unit/engine – otherwise use CPS 533 – Pumping Plant), emergency generators, or engines providing power for other agricultural systems. Resource Concerns: Air Quality – Emissions of Particulate Matter (PM) and PM Precursors; Air Quality – Emissions of Ozone Precursors; Inefficient Energy Use – Equipment and Facilities; Inefficient Energy Use – Farming/Ranching Practices and Field Operations. Associated Practices include: 374 – Farmstead Energy Improvement; 533 – Pumping Plant; 430 – Irrigation Pipeline; 441 – Irrigation System, Microirrigation; 442 – Sprinkler System; 447 – Irrigation System, Tailwater Recovery; 449 – Irrigation Water Management; 516 – Livestock Pipeline; 313 – Waste Storage Facility; 634 – Waste Transfer; 642 – Water Well; and 614 – Watering Facility.

Before Situation:

An old or inefficient diesel engine provides power to an agricultural system, such as an irrigation pumping plant or grain dryer fan, or provides backup power generation for a farming operation. Air Quality Impacts: The existing internal combustion engine emissions are identified to contribute to an air quality resource concern. Inefficient Energy Use: The existing internal combustion engine uses excess fuel to provide power to an agricultural system.

After Situation:

The existing older diesel engine is replaced with a new electric motor (12-74 hp). The engine being replaced or repowered will be destroyed or disabled and a certificate of destruction or inoperability submitted prior to certification of practice completion. The existing engine is supported by a concrete pad; no costs have been included for a new pad. Additional costs may be incurred if a concrete pad is not present. Air Quality Impacts: The new electric motor does not produce any on-farm emissions of particulate matter or oxides of nitrogen, resulting in a substantial emissions reduction on the farm. Inefficient Energy Use: Energy efficiency will be improved.

Feature Measure: Number of Combustion Units Repla

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $4,315.31

Scenario Cost/Unit: $4,315.31

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	12	$409.44
Materials						
Motor, electric, NEMA Premium, 50 HP	1173	Premium NEMA approved electric motor, 50 Horsepower and all required appurtenances. Includes materials and shipping only.	Each	$3,905.87	1	$3,905.87

Practice: 372 - Combustion System Improvement

Scenario: #7 - Electric Motor in-lieu of IC Engine, 75-149 HP

Scenario Description:

Replace an existing older diesel engine with a new electric motor (75-149 hp). The existing diesel engine may be stationary or portable, but not mobile (i.e., providing motive power to tractors, trucks, etc.). Examples of stationary or portable engines include diesel-fired pumping plant power units (if the only change is replacing the power unit/engine – otherwise use CPS 533 – Pumping Plant), emergency generators, or engines providing power for other agricultural systems. Resource Concerns: Air Quality – Emissions of Particulate Matter (PM) and PM Precursors; Air Quality – Emissions of Ozone Precursors; Inefficient Energy Use – Equipment and Facilities; Inefficient Energy Use – Farming/Ranching Practices and Field Operations. Associated Practices include: 374 – Farmstead Energy Improvement; 533 – Pumping Plant; 430 – Irrigation Pipeline; 441 – Irrigation System, Microirrigation; 442 – Sprinkler System; 447 – Irrigation System, Tailwater Recovery; 449 – Irrigation Water Management; 516 – Livestock Pipeline; 313 – Waste Storage Facility; 634 – Waste Transfer; 642 – Water Well; and 614 – Watering Facility.

Before Situation:

An old or inefficient diesel engine provides power to an agricultural system, such as an irrigation pumping plant or grain dryer fan, or provides backup power generation for a farming operation. Air Quality Impacts: The existing internal combustion engine emissions are identified to contribute to an air quality resource concern. Inefficient Energy Use: The existing internal combustion engine uses excess fuel to provide power to an agricultural system.

After Situation:

The existing older diesel engine is replaced with a new electric motor (75-149 hp). The engine being replaced or repowered will be destroyed or disabled and a certificate of destruction or inoperability submitted prior to certification of practice completion. The existing engine is supported by a concrete pad; no costs have been included for a new pad. Additional costs may be incurred if a concrete pad is not present. Air Quality Impacts: The new electric motor does not produce any on-farm emissions of particulate matter or oxides of nitrogen, resulting in a substantial emissions reduction on the farm. Inefficient Energy Use: Energy efficiency will be improved.

Feature Measure: Number of Combustion Units Repla

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $8,990.37

Scenario Cost/Unit: $8,990.37

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	16	$545.92
Materials						
Motor, electric, NEMA Premium, 100 HP	1174	Premium NEMA approved electric motor, 100 Horsepower and all required appurtenances. Includes materials and shipping only.	Each	$8,444.45	1	$8,444.45

Practice: 372 - Combustion System Improvement

Scenario: #8 - Electric Motor in-lieu of IC Engine, 150-299 HP

Scenario Description:

Replace an existing older diesel engine with a new electric motor (150-299 hp). The existing diesel engine may be stationary or portable, but not mobile (i.e., providing motive power to tractors, trucks, etc.). Examples of stationary or portable engines include diesel-fired pumping plant power units (if the only change is replacing the power unit/engine – otherwise use CPS 533 – Pumping Plant), emergency generators, or engines providing power for other agricultural systems. Resource Concerns: Air Quality – Emissions of Particulate Matter (PM) and PM Precursors; Air Quality – Emissions of Ozone Precursors; Inefficient Energy Use – Equipment and Facilities; Inefficient Energy Use – Farming/Ranching Practices and Field Operations. Associated Practices include: 374 – Farmstead Energy Improvement; 533 – Pumping Plant; 430 – Irrigation Pipeline; 441 – Irrigation System, Microirrigation; 442 – Sprinkler System; 447 – Irrigation System, Tailwater Recovery; 449 – Irrigation Water Management; 516 – Livestock Pipeline; 313 – Waste Storage Facility; 634 – Waste Transfer; 642 – Water Well; and 614 – Watering Facility.

Before Situation:

An old or inefficient diesel engine provides power to an agricultural system, such as an irrigation pumping plant or grain dryer fan, or provides backup power generation for a farming operation. Air Quality Impacts: The existing internal combustion engine emissions are identified to contribute to an air quality resource concern. Inefficient Energy Use: The existing internal combustion engine uses excess fuel to provide power to an agricultural system.

After Situation:

The existing older diesel engine is replaced with a new electric motor (150-299 hp). The engine being replaced or repowered will be destroyed or disabled and a certificate of destruction or inoperability submitted prior to certification of practice completion. The existing engine is supported by a concrete pad; no costs have been included for a new pad. Additional costs may be incurred if a concrete pad is not present. Air Quality Impacts: The new electric motor does not produce any on-farm emissions of particulate matter or oxides of nitrogen, resulting in a substantial emissions reduction on the farm. Inefficient Energy Use: Energy efficiency will be improved.

Feature Measure: Number of Combustion Units Repla

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $16,359.35

Scenario Cost/Unit: $16,359.35

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	40	$1,364.80
Materials						
Motor, electric, NEMA Premium, 200 HP	1175	Premium NEMA approved electric motor, 200 Horsepower and all required appurtenances. Includes materials and shipping only.	Each	$14,994.55	1	$14,994.55

Practice: 372 - Combustion System Improvement

Scenario: #9 - Electric Motor in-lieu of IC Engine, >=300 HP

Scenario Description:

Replace an existing older diesel engine with a new electric motor (>=300 hp). The existing diesel engine may be stationary or portable, but not mobile (i.e., providing motive power to tractors, trucks, etc.). Examples of stationary or portable engines include diesel-fired pumping plant power units (if the only change is replacing the power unit/engine – otherwise use CPS 533 – Pumping Plant), emergency generators, or engines providing power for other agricultural systems. Resource Concerns: Air Quality – Emissions of Particulate Matter (PM) and PM Precursors; Air Quality – Emissions of Ozone Precursors; Inefficient Energy Use – Equipment and Facilities; Inefficient Energy Use – Farming/Ranching Practices and Field Operations. Associated Practices include: 374 – Farmstead Energy Improvement; 533 – Pumping Plant; 430 – Irrigation Pipeline; 441 – Irrigation System, Microirrigation; 442 – Sprinkler System; 447 – Irrigation System, Tailwater Recovery; 449 – Irrigation Water Management; 516 – Livestock Pipeline; 313 – Waste Storage Facility; 634 – Waste Transfer; 642 – Water Well; and 614 – Watering Facility.

Before Situation:

An old or inefficient diesel engine provides power to an agricultural system, such as an irrigation pumping plant or grain dryer fan, or provides backup power generation for a farming operation. Air Quality Impacts: The existing internal combustion engine emissions are identified to contribute to an air quality resource concern. Inefficient Energy Use: The existing internal combustion engine uses excess fuel to provide power to an agricultural system.

After Situation:

The existing older diesel engine is replaced with a new electric motor (>=300 hp). The engine being replaced or repowered will be destroyed or disabled and a certificate of destruction or inoperability submitted prior to certification of practice completion. The existing engine is supported by a concrete pad; no costs have been included for a new pad. Additional costs may be incurred if a concrete pad is not present. Air Quality Impacts: The new electric motor does not produce any on-farm emissions of particulate matter or oxides of nitrogen, resulting in a substantial emissions reduction on the farm. Inefficient Energy Use: Energy efficiency will be improved.

Feature Measure: Number of Combustion Units Repla

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $29,188.80

Scenario Cost/Unit: $29,188.80

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	40	$1,364.80
Materials						
Motor, electric, NEMA Premium, 400 to 499 hp	1439	Premium NEMA approved Electric Motor and required appurtenances. 400 to 499 hp (296 - 372 kW). Includes materials and shipping only.	Horsepower	$69.56	400	$27,824.00

Practice: 373 - Dust Control on Unpaved Roads and Surfaces

Scenario: #1 - Water Application - Once per Day

Scenario Description:

Application of water as a dust suppressant once per day to an unpaved road or other unpaved surface where vehicle or wind action may result in emissions of particulate matter without treatment. The specific resource concern to be addressed is "Emissions of Particulate Matter (PM) and PM Precursors".

Before Situation:

The operation does not apply a dust suppressant to an unpaved surface. Vehicle or wind action on the untreated unpaved surface results in emissions of particulate matter that cause nuisance dusting or visibility-impairment effects.

After Situation:

The unpaved surface is graded and potholes are filled three times per year. Water is applied via truck once per day as a dust suppressant to the unpaved surface with a minimization of overlap and avoidance of over-application of water. This scenario assumes a treated area of 1/4 mile in length and 12 feet in width. Associated practices include 560 - Access Road, 472 - Access Control, 561 - Heavy Use Area Protection, 342 - Critical Area Planting, 430 - Irrigation Pipeline, 436 - Irrigation Reservoir, 516 - Pipeline, 533 - Pumping Plant, 449 - Irrigation Water Management, 484 - Mulching, and 380 - Windbreak/Shelterbelt Establishment.

Feature Measure: Area Treated

Scenario Unit: Square Yard

Scenario Typical Size: 1,760.0

Scenario Total Cost: $2,416.62

Scenario Cost/Unit: $1.37

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	132.7	$708.62
Motor Grader, 200 HP	1782	Motor Grader or Maintainer, 200 hp. Typical of equipment with HP in range of 170-225. Equipment cost, does not include labor.	Hours	$170.80	10	$1,708.00

Practice: 373 - Dust Control on Unpaved Roads and Surfaces

Scenario: #2 - Water Application - Twice per Day

Scenario Description:

Application of water as a dust suppressant twice per day to an unpaved road or other unpaved surface where vehicle or wind action may result in emissions of particulate matter without treatment. The specific resource concern to be addressed is "Emissions of Particulate Matter (PM) and PM Precursors".

Before Situation:

The operation does not apply a dust suppressant to an unpaved surface. Vehicle or wind action on the untreated unpaved surface results in emissions of particulate matter that cause nuisance dusting or visibility-impairment effects.

After Situation:

The unpaved surface is graded and potholes are filled three times per year. Water is applied via truck twice per day as a dust suppressant to the unpaved surface with a minimization of overlap and avoidance of over-application of water. This scenario assumes a treated area of 1/4 mile in length and 12 feet in width. Associated practices include 560 - Access Road, 472 - Access Control, 561 - Heavy Use Area Protection, 342 - Critical Area Planting, 430 - Irrigation Pipeline, 436 - Irrigation Reservoir, 516 - Pipeline, 533 - Pumping Plant, 449 - Irrigation Water Management, 484 - Mulching, and 380 - Windbreak/Shelterbelt Establishment.

Feature Measure: Area Treated

Scenario Unit: Square Yard

Scenario Typical Size: 1,760.0

Scenario Total Cost: $3,125.77

Scenario Cost/Unit: $1.78

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	265.5	$1,417.77
Motor Grader, 200 HP	1782	Motor Grader or Maintainer, 200 hp. Typical of equipment with HP in range of 170-225. Equipment cost, does not include labor.	Hours	$170.80	10	$1,708.00

Practice: 373 - Dust Control on Unpaved Roads and Surfaces

Scenario: #3 - Water Application - Once per Week

Scenario Description:

Application of water as a dust suppressant once per week to an unpaved road or other unpaved surface where vehicle or wind action may result in emissions of particulate matter without treatment. The specific resource concern to be addressed is "Emissions of Particulate Matter (PM) and PM Precursors".

Before Situation:

The operation does not apply a dust suppressant to an unpaved surface. Vehicle or wind action on the untreated unpaved surface results in emissions of particulate matter that cause nuisance dusting or visibility-impairment effects.

After Situation:

The unpaved surface is graded and potholes are filled three times per year. Water is applied via truck once per week as a dust suppressant to the unpaved surface with a minimization of overlap and avoidance of over-application of water. This scenario assumes a treated area of 1/4 mile in length and 12 feet in width. Associated practices include 560 - Access Road, 472 - Access Control, 561 - Heavy Use Area Protection, 342 - Critical Area Planting, 430 - Irrigation Pipeline, 436 - Irrigation Reservoir, 516 - Pipeline, 533 - Pumping Plant, 449 - Irrigation Water Management, 484 - Mulching, and 380 - Windbreak/Shelterbelt Establishment.

Feature Measure: Area Treated

Scenario Unit: Square Yard

Scenario Typical Size: 1,760.0

Scenario Total Cost: $1,808.93

Scenario Cost/Unit: $1.03

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	18.9	$100.93
Motor Grader, 200 HP	1782	Motor Grader or Maintainer, 200 hp. Typical of equipment with HP in range of 170-225. Equipment cost, does not include labor.	Hours	$170.80	10	$1,708.00

Practice: 373 - Dust Control on Unpaved Roads and Surfaces

Scenario: #4 - Petroleum-Based Road Oil Application - Once per Year

Scenario Description:

Application of a petroleum-based road oil as a dust suppressant once per year to an unpaved road or other unpaved surface where vehicle or wind action may result in emissions of particulate matter without treatment. The specific resource concern to be addressed is "Emissions of Particulate Matter (PM) and PM Precursors".

Before Situation:

The operation does not apply a dust suppressant to an unpaved surface. Vehicle or wind action on the untreated unpaved surface results in emissions of particulate matter that cause nuisance dusting or visibility-impairment effects.

After Situation:

The unpaved surface is graded and potholes are filled once per year. Petroleum-based road oil is applied via truck once per year as a dust suppressant to the unpaved surface with a minimization of overlap and avoidance of over-application. This scenario assumes a treated area of 1/4 mile in length and 12 feet in width. Associated practices include 560 - Access Road, 472 - Access Control, 561 - Heavy Use Area Protection, 342 - Critical Area Planting, 635 - Vegetated Treatment Area, 430 - Irrigation Pipeline, 436 - Irrigation Reservoir, 516 - Pipeline, 533 - Pumping Plant, 449 - Irrigation Water Management, 484 - Mulching, and 380 - Windbreak/Shelterbelt Establishment.

Feature Measure: Area Treated

Scenario Unit: Square Yard

Scenario Typical Size: 1,760.0

Scenario Total Cost: $3,778.12

Scenario Cost/Unit: $2.15

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	0.36	$1.92
Motor Grader, 200 HP	1782	Motor Grader or Maintainer, 200 hp. Typical of equipment with HP in range of 170-225. Equipment cost, does not include labor.	Hours	$170.80	5	$854.00
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	5	$168.20
Materials						
Chemical, dust control, road oil, petroleum-based	1339	Petroleum-based road oil, such as SC-250 or SC-800. Includes materials and shipping only.	Gallons	$3.06	900	$2,754.00

Practice: 373 - Dust Control on Unpaved Roads and Surfaces

Scenario: #5 - Hygroscopic Salt Application - Once per Year

Scenario Description:

Application of a hygroscopic salt (calcium chloride, magnesium chloride, sodium chloride, etc.) as a dust suppressant once per year to an unpaved road or other unpaved surface where vehicle or wind action may result in emissions of particulate matter without treatment. The specific resource concern to be addressed is "Emissions of Particulate Matter (PM) and PM Precursors".

Before Situation:

The operation does not apply a dust suppressant to an unpaved surface. Vehicle or wind action on the untreated unpaved surface results in emissions of particulate matter that cause nuisance dusting or visibility-impairment effects.

After Situation:

The unpaved surface is graded and potholes are filled once per year. Hygroscopic salt solution is applied via truck once per year as a dust suppressant to the unpaved surface with a minimization of overlap and avoidance of over-application. Once the dust suppressant is applied, the treated surface is compacted. This scenario assumes a treated area of 1/4 mile in length and 12 feet in width. Associated practices include 560 - Access Road, 472 - Access Control, 561 - Heavy Use Area Protection, 342 - Critical Area Planting, 635 - Vegetated Treatment Area, 430 - Irrigation Pipeline, 436 - Irrigation Reservoir, 516 - Pipeline, 533 - Pumping Plant, 449 - Irrigation Water Management, 484 - Mulching, and 380 - Windbreak/Shelterbelt Establishment.

Feature Measure: Area Treated

Scenario Unit: Square Yard

Scenario Typical Size: 1,760.0

Scenario Total Cost: $2,041.80

Scenario Cost/Unit: $1.16

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	0.36	$1.92
Roller, static, smooth, self propelled	1392	Self propelled smooth drum static roller compactor, typically 1.5 ton with 34 inch roller. Equipment cost only. Does not include labor.	Hours	$16.20	2	$32.40
Motor Grader, 200 HP	1782	Motor Grader or Maintainer, 200 hp. Typical of equipment with HP in range of 170-225. Equipment cost, does not include labor.	Hours	$170.80	5	$854.00
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	7	$235.48
Materials						
Chemical, dust control, hygroscopic salt solution	1340	Hygroscopic salt solution, such as calcium chloride, magnesium chloride, or sodium chloride. Materials only.	Gallons	$1.02	900	$918.00

Practice: 373 - Dust Control on Unpaved Roads and Surfaces

Scenario: #6 - Lignosulfonate Application - Once per Year

Scenario Description:

Application of an adhesive (i.e., lignosulfonate) as a dust suppressant once per year to an unpaved road or other unpaved surface where vehicle or wind action may result in emissions of particulate matter without treatment. The specific resource concern to be addressed is "Emissions of Particulate Matter (PM) and PM Precursors".

Before Situation:

The operation does not apply a dust suppressant to an unpaved surface. Vehicle or wind action on the untreated unpaved surface results in emissions of particulate matter that cause nuisance dusting or visibility-impairment effects.

After Situation:

The unpaved surface is graded and potholes are filled once per year. An adhesive, such as lignosulfonate, is applied via truck once per year as a dust suppressant to the unpaved surface with a minimization of overlap and avoidance of over-application. Once the dust suppressant is applied, the treated surface is compacted. This scenario assumes a treated area of 1/4 mile in length and 12 feet in width. Associated practices include 560 - Access Road, 472 - Access Control, 561 - Heavy Use Area Protection, 342 - Critical Area Planting, 635 - Vegetated Treatment Area, 430 - Irrigation Pipeline, 436 - Irrigation Reservoir, 516 - Pipeline, 533 - Pumping Plant, 449 - Irrigation Water Management, 484 - Mulching, and 380 - Windbreak/Shelterbelt Establishment.

Feature Measure: Area Treated

Scenario Unit: Square Yard

Scenario Typical Size: 1,760.0

Scenario Total Cost: $2,923.80

Scenario Cost/Unit: $1.66

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	0.36	$1.92
Roller, static, smooth, self propelled	1392	Self propelled smooth drum static roller compactor, typically 1.5 ton with 34 inch roller. Equipment cost only. Does not include labor.	Hours	$16.20	2	$32.40
Motor Grader, 200 HP	1782	Motor Grader or Maintainer, 200 hp. Typical of equipment with HP in range of 170-225. Equipment cost, does not include labor.	Hours	$170.80	5	$854.00
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	7	$235.48
Materials						
Chemical, dust control, adhesive, lignosulfonate	1341	Adhesive, such as lignosulfonate. Includes materials and shipping only.	Gallons	$2.00	900	$1,800.00

Practice: 373 - Dust Control on Unpaved Roads and Surfaces

Scenario: #7 - Petroleum Emulsion Application - Once per Year

Scenario Description:

Application of a petroleum emulsion as a dust suppressant once per year to an unpaved road or other unpaved surface where vehicle or wind action may result in emissions of particulate matter without treatment. The specific resource concern to be addressed is "Emissions of Particulate Matter (PM) and PM Precursors".

Before Situation:

The operation does not apply a dust suppressant to an unpaved surface. Vehicle or wind action on the untreated unpaved surface results in emissions of particulate matter that cause nuisance dusting or visibility-impairment effects.

After Situation:

The unpaved surface is graded and potholes are filled once per year. A petroleum emulsion is applied via truck once per year as a dust suppressant to the unpaved surface with a minimization of overlap and avoidance of over-application. Once the dust suppressant is applied, the treated surface is compacted. This scenario assumes a treated area of 1/4 mile in length and 12 feet in width. Associated practices include 560 - Access Road, 472 - Access Control, 561 - Heavy Use Area Protection, 342 - Critical Area Planting, 635 - Vegetated Treatment Area, 430 - Irrigation Pipeline, 436 - Irrigation Reservoir, 516 - Pipeline, 533 - Pumping Plant, 449 - Irrigation Water Management, 484 - Mulching, and 380 - Windbreak/Shelterbelt Establishment.

Feature Measure: Area Treated

Scenario Unit: Square Yard

Scenario Typical Size: 1,760.0

Scenario Total Cost: $2,167.80

Scenario Cost/Unit: $1.23

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	0.36	$1.92
Roller, static, smooth, self propelled	1392	Self propelled smooth drum static roller compactor, typically 1.5 ton with 34 inch roller. Equipment cost only. Does not include labor.	Hours	$16.20	2	$32.40
Motor Grader, 200 HP	1782	Motor Grader or Maintainer, 200 hp. Typical of equipment with HP in range of 170-225. Equipment cost, does not include labor.	Hours	$170.80	5	$854.00
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	7	$235.48
Materials						
Chemical, dust control, petroleum emulsion	1342	Petroleum emulsio. Includes materials and shipping only.	Gallons	$1.16	900	$1,044.00

Practice: 373 - Dust Control on Unpaved Roads and Surfaces

Scenario: #8 - Polymer Emulsion Application - Once per Year

Scenario Description:

Application of a polymer emulsion, such as polyacrylamide (PAM), as a dust suppressant once per year to an unpaved road or other unpaved surface where vehicle or wind action may result in emissions of particulate matter without treatment. The specific resource concern to be addressed is "Emissions of Particulate Matter (PM) and PM Precursors".

Before Situation:

The operation does not apply a dust suppressant to an unpaved surface. Vehicle or wind action on the untreated unpaved surface results in emissions of particulate matter that cause nuisance dusting or visibility-impairment effects.

After Situation:

The unpaved surface is graded and potholes are filled once per year. A polymer emulsion is applied via truck once per year as a dust suppressant to the unpaved surface with a minimization of overlap and avoidance of over-application. Once the dust suppressant is applied, the treated surface is compacted. This scenario assumes a treated area of 1/4 mile in length and 12 feet in width. Associated practices include 560 - Access Road, 472 - Access Control, 450 - Anionic Polyacrylamide (PAM) Application, 561 - Heavy Use Area Protection, 342 - Critical Area Planting, 635 - Vegetated Treatment Area, 430 - Irrigation Pipeline, 436 - Irrigation Reservoir, 516 - Pipeline, 533 - Pumping Plant, 449 - Irrigation Water Management, 484 - Mulching, and 380 - Windbreak/Shelterbelt Establishment.

Feature Measure: Area Treated

Scenario Unit: Square Yard

Scenario Typical Size: 1,760.0

Scenario Total Cost: $5,695.80

Scenario Cost/Unit: $3.24

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	0.36	$1.92
Roller, static, smooth, self propelled	1392	Self propelled smooth drum static roller compactor, typically 1.5 ton with 34 inch roller. Equipment cost only. Does not include labor.	Hours	$16.20	2	$32.40
Motor Grader, 200 HP	1782	Motor Grader or Maintainer, 200 hp. Typical of equipment with HP in range of 170-225. Equipment cost, does not include labor.	Hours	$170.80	5	$854.00
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	7	$235.48
Materials						
Chemical, dust control, polymer emulsion, tanker purchase	1343	Polymer emulsion, such as polyacrylamide purchased in bulk. Includes materials and shipping only.	Gallons	$5.08	900	$4,572.00

Practice: 373 - Dust Control on Unpaved Roads and Surfaces

Scenario: #9 - Clay Additive Application - Once per Year

Scenario Description:

Application of a clay additive as a dust suppressant once per 5 years to an unpaved road or other unpaved surface where vehicle or wind action may result in emissions of particulate matter without treatment. The specific resource concern to be addressed is "Emissions of Particulate Matter (PM) and PM Precursors".

Before Situation:

The operation does not apply a dust suppressant to an unpaved surface. Vehicle or wind action on the untreated unpaved surface results in emissions of particulate matter that cause nuisance dusting or visibility-impairment effects.

After Situation:

The unpaved surface is graded and potholes are filled prior to the application. A clay additive is applied once per 5 years as a dust suppressant to the unpaved surface and mixed into the surface with a water application and road grading or other mechanical mixing. This scenario assumes a treated area of 1/4 mile in length and 12 feet in width. Associated practices include 560 - Access Road, 472 - Access Control, 561 - Heavy Use Area Protection, 342 - Critical Area Planting, 635 - Vegetated Treatment Area, 430 - Irrigation Pipeline, 436 - Irrigation Reservoir, 516 - Pipeline, 533 - Pumping Plant, 449 - Irrigation Water Management, 484 - Mulching, and 380 - Windbreak/Shelterbelt Establishment.

Feature Measure: Area Treated

Scenario Unit: Square Yard

Scenario Typical Size: 1,760.0

Scenario Total Cost: $29,183.04

Scenario Cost/Unit: $16.58

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	0.36	$1.92
Motor Grader, 200 HP	1782	Motor Grader or Maintainer, 200 hp. Typical of equipment with HP in range of 170-225. Equipment cost, does not include labor.	Hours	$170.80	8	$1,366.40
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	8	$269.12
Materials						
Bentonite	41	Bentonite, includes materials (50# bag)	Each	$21.52	1280	$27,545.60

Practice: 374 - Farmstead Energy Improvement

Scenario: #5 - Ventilation - Exhaust

Scenario Description:

Replacement of a conventional exhaust fan with high volume, low speed, efficient exhaust fan. Fans being installed should be models previously tested by BESS Lab or the Air Movement and Control Association and be in top 20 percentile of fans tested. Practice certification will be through receipts and pictures from the applicant. Typical scenario includes the replacement of a 48" fan.

Before Situation:

Inefficient ventilation in an agricultural building.

After Situation:

High-efficiency ventilation system which reduces energy use. The new ventilation equipment will provide suitable air quality and reduce overall power requirements (kW) compared to the existing ventilation system as evidenced in an energy audit. Associated practices/activities: may include 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Each

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $1,573.82

Scenario Cost/Unit: $1,573.82

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	3	$102.36
Materials						
Fan, exhaust, 48 in. High Efficiency	1187	48 inch high efficiency exhaust fan, controls, wiring, and associated appurtenances. Materials only.	Each	$1,471.46	1	$1,471.46

Practice: 374 - Farmstead Energy Improvement

Scenario: #6 - Ventilation - HAF

Scenario Description:

A system of fans are installed to create a horizontal air circulation pattern; the new system promotes efficient heat and moisture distribution. In a typical 10,000 square foot greenhouse, 10 HAF fans are needed. Fan performance meets Energy Audit efficiency criteria as tested by AMCA or BESS Labs.

Before Situation:

Inefficent air circulation system in a greenhouse.

After Situation:

High-efficiency air circulation system which reduces energy use. The new equipment will provide suitable air quality and reduce overall power requirements (kW) compared to the existing system as evidenced in an energy audit. Associated practices/activities: may include 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Each

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $236.34

Scenario Cost/Unit: $236.34

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	2	$68.24
Materials						
Fan, HAF, 1/10 to 1/15 HP	1189	High efficiency Horizontal Air Flow (HAF) fan, controls, wiring, and associated appurtenances. Materials only.	Each	$168.10	1	$168.10

Practice: 374 - Farmstead Energy Improvement

Scenario: #7 - Plate Cooler

Scenario Description:
The installation of all stainless steel dual pass plate cooler, type 316 stainless steel. Practice certification will be through receipts and pictures from the applicant.

Before Situation:
Inefficient milk cooling (minimal pre-cooling of milk before entering the bulk tank).

After Situation:
High-efficiency milk cooling system which reduces energy use. The new milk cooling equipment will pre-cool the milk and reduce overall power requirements (kW) compared to the existing milk cooling system (where most of the cooling was accomplished in the bulk tank) as evidenced in an energy audit. Associated practices/activities: may include 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Each

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $24,713.07

Scenario Cost/Unit: $24,713.07

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	8	$272.96
Materials						
Plate Cooler, 750 - 999 gal/hr capacity	1178	Stainless Steel, dual pass plate cooler with 750 - 999 gallon/hour capacity. Includes materials and shipping only.	Each	$24,440.11	1	$24,440.11

Practice: 374 - Farmstead Energy Improvement

Scenario: #8 - Scroll Compressor

Scenario Description:

Install a new scroll compressor, associated controls, wiring, and materials to retrofit an existing refrigeration system. A new condenser is not included in this typical scenario. Typical scenario includes a new 5 horsepower scroll compressor.

Before Situation:

Inefficient reciprocating compressor as a key component of the refrigeration system used to cool milk. The compressor is a critical part of a milk cooling system, affecting milk quality, system reliability, and system efficiency.

After Situation:

A more efficient scroll compressor, which will reduce energy use, is evidenced by the energy audit. A comparably sized scroll compressor provides refrigeration capacity at a higher efficiency than a reciprocating compressor. Newer scroll compressor systems typically reduce electricity use by 15 to 25 percent compared to reciprocating compressors. Associated practices/activities: may include 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Horse Power

Scenario Unit: Horsepower

Scenario Typical Size: 5.0

Scenario Total Cost: $2,891.35

Scenario Cost/Unit: $578.27

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	4	$136.48
Materials						
Scroll Compressor - 5 HP	1183	Scroll compressor, 5 Horsepower, controls, wiring, and appurtenances. Materials only.	Each	$2,754.87	1	$2,754.87

Practice: 374 - Farmstead Energy Improvement

Scenario: #9 - Variable Speed Drive > 5 HP

Scenario Description:

The typical scenario consists of a variable speed drive (VSD) and appurtances, such as hook-ups, control panels, wiring, control blocks, filters, switches, pads, etc. attached to an electric motor used to drive a ventilation fan, irrigation pumps, vacuum pump, or similar equipment involved with agricultural production. The motor size, on which the VSD is added, is larger than 5 HP.

Before Situation:

The system is inefficient when a motor operates at constant speed to satisfy a load which varies as to flow rate and/or pressure requirements.

After Situation:

An on-farm energy audit has determined that energy use can be reduced through use of a VSD to control electric motors. After the VSD is applied, the motor speed can be adjusted to reduce power requirements and better match varied flow or pressure requirements. Associated practices/activities: may include 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: HP

Scenario Unit: Horsepower

Scenario Typical Size: 50.0

Scenario Total Cost: $5,470.46

Scenario Cost/Unit: $109.41

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	8	$272.96
Materials						
Variable Speed Drive, 50 HP	1288	Variable speed drive for 50 Horsepower electric motor. Does not include motor. Materials only.	Horsepower	$103.95	50	$5,197.50

Practice: 374 - Farmstead Energy Improvement

Scenario: #10 - Automatic Controller System

Scenario Description:

The typical scenario consists of an automatic control system installed on an existing manually controlled agricultural system. Typical components may include any of the following: wiring, sensors, data logger, logic controller, communication link, software, switches, and relay.

Before Situation:

A manually controlled system is existing in an agricultural facility that causes the inefficient use of energy, as evidenced by an on-farm energy audit.

After Situation:

An on-farm energy audit has determined that energy use can be reduced through use of an automatic controller that helps regulates the energy consumption of the existing system. Associated practices/activities may include: 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Each system

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $1,946.93

Scenario Cost/Unit: $1,946.93

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	8	$272.96
Materials						
Switches and Controls, temp sensors	1192	Temperature and soil moisture sensors installed as part of an electronic monitoring (with or without wireless telecommunications) commonly used to control pumps and irrigation systems	Each	$579.54	1	$579.54
Switches and Controls, programmable controller	1193	Programmable logic controller (with or without wireless telecommunications) commonly used to control pumps and irrigation systems	Each	$307.65	1	$307.65
Switches and Controls, Wi-Fi system and software	1194	Software with built-in cellular or Wi-Fi communication commonly used to control pumps and irrigation systems	Each	$786.78	1	$786.78

Practice: 374 - Farmstead Energy Improvement

Scenario: #11 - Motor Upgrade > 100 HP

Scenario Description:

The typical scenario consists of replacing an existing electric motor used to drive a ventilation fan, irrigation pumps, vacuum pump, or similar equipment involved with agricultural production with a new, high efficiency motor. The motor size is larger than 100 horsepower.

Before Situation:

The system is inefficient with a standard efficiency motor.

After Situation:

An on-farm energy audit has determined that energy use can be reduced through use of a NEMA premium efficiency motor. Associated practices/activities may include: 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Each

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $15,540.47

Scenario Cost/Unit: $15,540.47

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	16	$545.92
Materials						
Motor, electric, NEMA Premium, 200 HP	1175	Premium NEMA approved electric motor, 200 Horsepower and all required appurtenances. Includes materials and shipping only.	Each	$14,994.55	1	$14,994.55

Practice: 374 - Farmstead Energy Improvement

Scenario: #12 - Motor Upgrade 10 - 100 HP

Scenario Description:

The typical scenario consists of replacing an existing electric motor used to drive a ventilation fan, irrigation pumps, vacuum pump, or similar equipment involved with agricultural production with a new, high efficiency motor. The motor size is equal to or larger than 10 and less than or equal to 100 horsepower.

Before Situation:

The system is inefficient with a standard efficiency motor.

After Situation:

An on-farm energy audit has determined that energy use can be reduced through use of a NEMA premium efficiency motor. Associated practices/activities may include: 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Horsepower

Scenario Unit: Horsepower

Scenario Typical Size: 50.0

Scenario Total Cost: $4,178.83

Scenario Cost/Unit: $83.58

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	8	$272.96
Materials						
Motor, electric, NEMA Premium, 50 HP	1173	Premium NEMA approved electric motor, 50 Horsepower and all required appurtenances. Includes materials and shipping only.	Each	$3,905.87	1	$3,905.87

Practice: 374 - Farmstead Energy Improvement

Scenario: #13 - Motor Upgrade > 1 and < 10 HP

Scenario Description:

The typical scenario consists of replacing an existing electric motor used to drive a ventilation fan, irrigation pumps, vacuum pump, or similar equipment involved with agricultural production with a new, high efficiency motor. The motor size is larger than 1 and less than 10 horsepower.

Before Situation:

The system is inefficient with a standard efficiency motor.

After Situation:

An on-farm energy audit has determined that energy use can be reduced through use of a NEMA premium efficiency motor. Associated practices/activities may include: 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Horsepower

Scenario Unit: Horsepower

Scenario Typical Size: 5.0

Scenario Total Cost: $745.85

Scenario Cost/Unit: $149.17

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	4	$136.48
Materials						
Motor, electric, NEMA Premium, 5 HP	1171	Premium NEMA approved electric motor, 5 Horsepower and all required appurtenances. Includes materials and shipping only.	Each	$609.37	1	$609.37

Practice: 374 - Farmstead Energy Improvement

Scenario: #14 - Motor Upgrade <= 1 HP

Scenario Description:

The typical scenario consists of replacing an existing electric motor used to drive a ventilation fan, irrigation pumps, vacuum pump, or similar equipment involved with agricultural production with a new, high efficiency motor. The motor size is less than or equal to 1 horsepower.

Before Situation:

The system is inefficient with a standard efficiency motor.

After Situation:

An on-farm energy audit has determined that energy use can be reduced through use of a NEMA premium efficiency motor. Associated practices/activities may include: 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Each

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $587.51

Scenario Cost/Unit: $587.51

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	4	$136.48
Materials						
Motor, electric, NEMA Premium, 1 HP	1169	Premium NEMA approved electric motor, 1 Horsepower and all required appurtenances. Includes materials and shipping only.	Each	$451.03	1	$451.03

Practice: 374 - Farmstead Energy Improvement

Scenario: #15 - Heating - Radiant Systems

Scenario Description:

Replace "pancake" Brood Heaters in a poultry house with Radiant Tube Heaters, or similar. Replacement will require the materials and labor to remove existing heating system, re-plumb gas lines, cables and wench system to retrofit new radiant tube heaters, and miscellaneous items to complete the installation. Alternate acceptable radiant heating systems can include radiant brooders and quad radiant systems as evidenced by the energy audit. The typical scenario consists of the replacement of 28 brood heaters with 6 radiant tube heaters.

Before Situation:

Inefficient heat distribution equipment, such as conventional "pancake" brood heaters. The Pancake brooder, mounted at a low installation height, primarily warms the air. They provide a one-to-two foot perimeter at desired temperatures around each brooder. A large number of brooders are required to cover a significant percent of floor space. As the warmed air naturally rises it loses effectiveness for poultry on the ground.

After Situation:

Energy use is reduced through installation of a more efficient heater. Radiant tube heaters primarily warm objects within a direct line of sight (similar to the sun or an open fire). Air temperature is of relatively little importance for a radiant heating systems to be effective. As a result, radiant sytems are typically installed 5' or more above the floor level. This height extends the distribution of the radiant heat over a larger area than is possible with pancake style heaters. A roughly 16' diameter radiant heat zone heats over twice that of a convential pancake brooder. Associated practices/activities may include: 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Each

Scenario Unit: Each

Scenario Typical Size: 6.0

Scenario Total Cost: $9,201.28

Scenario Cost/Unit: $1,533.55

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	16	$545.92
Materials						
Heater, radiant tube	1163	Radiant tube heater rated at 125,000 BTU/hour. Materials only.	Each	$1,442.56	6	$8,655.36

Practice: 374 - Farmstead Energy Improvement

Scenario: #16 - Heating (Building)

Scenario Description:

Replace existing low efficiency heaters with new high efficiency heaters. High-efficiency heating systems include any heating unit with efficiency rating of 80%+ for fuel oil and 90%+ for natural gas and propane. Applications may be air heating/building environment and hydronic (boiler) heating for agricultural operations, including under bench, or root zone heating. An alternative to heater replacement might be the addition of climate control system and electronic temperature controls with +/- 1 degree F differential, to reduce the annual run time.

Before Situation:

Buildings heated with low efficiency heaters or heaters without proper electronic climate controls

After Situation:

Higher efficiency heaters reduce energy consumption, energy costs, and GHG emissions. These replacement systems can be fueled by natural gas, propane, or fuel oil. Associated practices/activities: 122-AgEMP - HQ and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Rated Heat Output

Scenario Unit: 1,000 BTU/Hour

Scenario Typical Size: 750.0

Scenario Total Cost: $12,860.92

Scenario Cost/Unit: $17.15

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	16	$545.92
Materials						
Heater, high efficiency	1165	Natural gas, propane, or fuel oil unit heater or boiler and venting materials. Based on input kBTU/hour. Includes materials and shipping only.	1,000 BTU/Hour	$16.42	750	$12,315.00

Practice: 374 - Farmstead Energy Improvement

Scenario: #17 - Heating - Attic Heat Recovery vents

Scenario Description:

Install actuated inlets or automatic latching gravity inlets that draw warmer, drier air from the attic to assist with moisture and heat control when ventiliation fans are being operated in poultry houses and swine barns. Other systems to transfer heat, as detailed in ASABE S612-compliant energy audit may also be used. Based on a 40' x 500' poultry house.

Before Situation:

Heated buildings with attic spaces but no means to transfer heat between the heated space, attic, and ambient (outside) air when relative conditions allow for reduced energy use.

After Situation:

Attic vents or inlets allow dry warm air from the attic to cirulated through out the building. By using pre-warmed air from the attic less energy is needed for heating 122-AgEMP - HQ and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Each inlet

Scenario Unit: Each

Scenario Typical Size: 14.0

Scenario Total Cost: $2,805.90

Scenario Cost/Unit: $200.42

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	24	$818.88
Materials						
Inlet, Attic Ceiling	2414	Poultry house attic air inlets. Includes materials only.	Each	$141.93	14	$1,987.02

Practice: 374 - Farmstead Energy Improvement

Scenario: #23 - Grain Dryer

Scenario Description:

A replacement continuous dryer rated for an appropriatle rated bushel/per hour capacity for the operation that includes a microcomputer-based control system that adjusts the amount of time the crop remains in the dryer in order to achieve a consistent and accurate moisture content in the dried product. Alternate types of replacement dryers which reduce energy use are acceptable as evidenced by the energy audit. The typical operation requires a rated capacity of 860 bushels per hour.

Before Situation:

Wet crop is loaded in the top of a horizontal, continuous dryer. Dried crop is augured from the bottom of the dryer. The heated air from the unit's burners passes from the burner plenum through the grain. An on-farm energy audit has identified inefficient manual control of the dryer where the operator controls the plenum temperature and the discharge auger speed to achieve the desired final moisture content. Moisture content is based on measurement of grain leaving the dryer. The plenum temperature setting depends on the moisture content of crop with a typical value of 220 F. The burner cycles on and off, automatically, as necessary to maintain the plenum temperature selected by the operator.

After Situation:

Energy use is reduced through installation of a more efficient continuous dryer that uses a microcomputer-based controller to reduce overdrying and total time of operation. Associated practices/activities may include: 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Rated capacity of the dryer

Scenario Unit: Bushel per Hour

Scenario Typical Size: 860.0

Scenario Total Cost: $139,783.36

Scenario Cost/Unit: $162.54

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	16	$545.92
Materials						
Grain dryer, Axial, 12 ft.	1158	Grain dryer, 12 foot Axial with rated capacity of 460 bushels/hour. Materials only.	Bushel per Hour	$188.35	172	$32,396.20
Grain dryer, Axial, 16 ft.	1159	Grain dryer, 16 foot Axial with rated capacity of 600 bushels/hour. Materials only.	Bushel per Hour	$157.42	172	$27,076.24
Grain dryer, Centrifugal, 20 ft.	1160	Grain dryer, 20 foot Centrifugal with rated capacity of 785 bushels/hour. Materials only.	Bushel per Hour	$168.04	172	$28,902.88
Grain dryer, Centrifugal, 24 ft.	1161	Grain dryer, 24 foot Centrifugal with rated capacity of 860 bushels/hr. Materials only.	Bushel per Hour	$137.59	172	$23,665.48
Grain dryer, Axial 28 ft.	1162	Grain dryer, 28 foot Axial with rated capacity of 990 bushels/hr. Materials only.	Bushel per Hour	$158.12	172	$27,196.64

Practice: 374 - Farmstead Energy Improvement

Scenario: #44 - Low Energy Livestock Waterers

Scenario Description:
Replace existing livestock waterers with a low energy livestock waterers on a one-to-one basis.

Before Situation:
Facilities utilizing low efficiency livestock waterers

After Situation:
Higher efficiency livestock waterers reduce energy consumption, energy costs, and GHG emissions. The new waterers will reduce overall power requirements (kW) compared to the existing equipment as evidenced in an energy audit. Associated practices/activities: 122-AgEMP - HQ and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a CAP 122 AgEMP - HQ or a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Each Unit

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $1,137.60

Scenario Cost/Unit: $1,137.60

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	3	$102.36
Materials						
Tank, Geothermal Tube Waterer	1062	Two head 18 gallon waterer. Includes materials and shipping only.	Each	$1,035.24	1	$1,035.24

Practice: 374 - Farmstead Energy Improvement

Scenario: #45 - Water Heating - Compressor Heat Recovery

Scenario Description:

Install a compressor heat recovery unit to an existing refrigeration system in order to capture heat extracted from milk during the refrigeration process. This heat is used to preheat water, reducing the amount of additional energy that needs to be supplied by a hot water heater.

Before Situation:

A facility where heat from the refrigeration system is not captured to be utilized to preheat water.

After Situation:

Compressor heat recovery units reduce energy consumption, energy costs, and GHG emissions. The new equipment will reduce overall power requirements (kW) compared to the existing equipment as evidenced in an energy audit. Associated practices/activities: 122-AgEMP - HQ and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a CAP 122 AgEMP - HQ or a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Each Unit

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $4,577.74

Scenario Cost/Unit: $4,577.74

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	8	$272.96
Materials						
Compressor heat recovery (CHR) unit, High Efficiency	1899	Compressor heat recovery (CHR) units (insulated storage tanks with heat exchangers) added to a refrigeration system, use the heat extracted from a warm fluid (e.g., milk) that passes through the hot gas refrigerant line from the refrigeration system's co	Each	$4,304.78	1	$4,304.78

Practice: 374 - Farmstead Energy Improvement

Scenario: #46 - Ventilation - Replacement of Less Efficient Circulation Fan with High Volume Low Speed Fan

Scenario Description:

Replacement of a less efficient circulation fan with a high volume, low speed, large diameter fan on a one for one basis. Practice certification will be through receipts and pictures from the applicant. Fan performance meets Energy Audit efficiency criteria as tested by AMCA or BESS Labs.

Before Situation:

Inefficient air circulation system in an enclosed agricultural production structure

After Situation:

High-efficiency air circulation system which reduces energy use. The new equipment will provide suitable air quality and reduce overall power requirements (kW) compared to the existing system as evidenced in an energy audit. Associated practices/activities: may include 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a CAP 122 AgEMP - HQ or a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Each Fan Replaced

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $6,062.48

Scenario Cost/Unit: $6,062.48

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	3	$102.36
Materials						
Fan, HVLS	2476	High velocity, low speed mechanical fan. Includes materials and shipping only.	Each	$5,960.12	1	$5,960.12

Practice: 374 - Farmstead Energy Improvement

Scenario: #52 - Washer - Extractor

Scenario Description:

Replace existing low efficiency laundry equipment with a new high efficiency washer-extractor on a one-to-one basis. A typical application includes laundering prep towels in a dairy. This scenario is not intended for a residential application.

Before Situation:

Facilities utilizing low efficiency laundry equipment

After Situation:

Higher efficiency washer-extractor units reduce energy consumption, energy costs, and GHG emissions associated with laundry facilities at dairies. The new washer-extractor has a minimum Modified Energy Factor (MEF) of no lower than 2.2 (Cu.Ft./kWh)/cycle, and is typically a non-residential unit with a 30-40 lb dry load capacity. The new equipment will reduce overall power requirements (kW) compared to the existing equipment as evidenced in an energy audit. Associated practices/activities: 122-AgEMP - HQ and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a CAP 122 AgEMP - HQ or a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Each Unit

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $8,753.99

Scenario Cost/Unit: $8,753.99

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	8	$272.96
Materials						
Washer Extractor	2489	Non-residential; 30 to 40 pound capacity (dry load); 4.3 - 6.0 cu.ft. (cylinder volume); minimum Modified Energy Factor (MEF) no lower than 2.2 (CuFt/kWh)/Cycle. Includes materials and shipping only.	Each	$8,481.03	1	$8,481.03

Practice: 374 - Farmstead Energy Improvement

Scenario: #66 - Water Heating - High Efficiency or Tankless Water Heater

Scenario Description:

Replace existing low efficiency hot water heaters with a new high efficiency water heater or a tankless water heater on a one-to-one basis. High-efficiency hot water heaters include those with an energy rating of 0.9+ for electric and 0.8+ for natural gas. Tankless water heaters should be direct vented and fitted with a high temperature spin down filter. A typical application includes heating wash water for the milking system and bulk tank in a dairy. This scenario is not intended for a residential application.

Before Situation:

A dairy utilizes low efficiency water heaters to heat wash water for the milking system and bulk tank. This scenario is not intended for a residential application.

After Situation:

Higher efficiency or tankless hot water heaters reduce energy consumption, energy costs, and GHG emissions. These replacement systems can be fueled by natural gas or propane. The new equipment will reduce overall power requirements (kW) compared to the existing equipment as evidenced in an energy audit. Associated practices/activities: 122-AgEMP - HQ and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a CAP 122 AgEMP - HQ or a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Each Unit

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $2,907.01

Scenario Cost/Unit: $2,907.01

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	8	$272.96
Materials						
Water Heater, High Efficiency	2485	Water heater with efficiency rating as per ASABE-S612. Includes materials and shipping only.	Each	$2,634.05	1	$2,634.05

Practice: 375 - Dust Control from Animal Activity on Open Lot Surfaces

Scenario: #1 - Manure Harvesting - Once per Year

Scenario Description:

Removal of loose, dry layer of manure from a confined animal operation once per year in addition to a regular annual manure clean-out to reduce emissions of particulate matter. The specific resource concern to be addressed is "Emissions of Particulate Matter (PM) and PM Precursors".

Before Situation:

The confined animal operation conducts a manure clean-out once per year. There is a dry, loose manure layer that is subject to animal activity resulting in emissions of particulate matter that cause nuisance dusting or visibility-impairment effects.

After Situation:

In addition to the annual manure clean-out, an additional manure harvesting removes the dry, loose manure layer from the pens and working alleys. This manure harvesting will leave a 1-2 inch layer of well-compacted manure above the mineral soil and a smooth pen/alley surface to deter ponding of moisture.

Feature Measure: Pen Surface Area, Including Workin

Scenario Unit: Acres

Scenario Typical Size: 1.0

Scenario Total Cost: $460.47

Scenario Cost/Unit: $460.47

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$46.88	3	$140.64
Front End Loader, 95 HP	1327	Wheeled front end loader with horsepower range of 80 to 110. Equipment and power unit costs. Labor not included.	Hours	$53.69	3	$161.07
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	6	$158.76

Practice: 375 - Dust Control from Animal Activity on Open Lot Surfaces

Scenario: #2 - Manure Harvesting - Twice per Year

Scenario Description:

Removal of loose, dry layer of manure from a confined animal operation twice per year in addition to a regular annual manure clean-out to reduce emissions of particulate matter. The specific resource concern to be addressed is "Emissions of Particulate Matter (PM) and PM Precursors".

Before Situation:

The confined animal operation conducts a manure clean-out once per year. There is a dry, loose manure layer that is subject to animal activity resulting in emissions of particulate matter that cause nuisance dusting or visibility-impairment effects.

After Situation:

In addition to the annual manure clean-out, two additional manure harvesting efforts remove the dry, loose manure layer from the pens and working alleys. Each manure harvesting will leave a 1-2 inch layer of well-compacted manure above the mineral soil and a smooth pen/alley surface to deter ponding of moisture.

Feature Measure: Pen Surface Area, Including Workin

Scenario Unit: Acres

Scenario Typical Size: 1.0

Scenario Total Cost: $920.94

Scenario Cost/Unit: $920.94

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$46.88	6	$281.28
Front End Loader, 95 HP	1327	Wheeled front end loader with horsepower range of 80 to 110. Equipment and power unit costs. Labor not included.	Hours	$53.69	6	$322.14
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	12	$317.52

Practice: 375 - Dust Control from Animal Activity on Open Lot Surfaces

Scenario: #3 - Manure Harvesting - More Than Twice per Year

Scenario Description:

Removal of loose, dry layer of manure from a confined animal operation more than twice per year in addition to a regular annual manure clean-out to reduce emissions of particulate matter. The specific resource concern to be addressed is "Emissions of Particulate Matter (PM) and PM Precursors".

Before Situation:

The confined animal operation conducts a manure clean-out once per year. There is a dry, loose manure layer that is subject to animal activity resulting in emissions of particulate matter that cause nuisance dusting or visibility-impairment effects.

After Situation:

In addition to the annual manure clean-out, four additional manure harvesting efforts remove the dry, loose manure layer from the pens and working alleys. Each manure harvesting will leave a 1-2 inch layer of well-compacted manure above the mineral soil and a smooth pen/alley surface to deter ponding of moisture.

Feature Measure: Pen Surface Area, Including Workin

Scenario Unit: Acres

Scenario Typical Size: 1.0

Scenario Total Cost: $1,841.88

Scenario Cost/Unit: $1,841.88

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$46.88	12	$562.56
Front End Loader, 95 HP	1327	Wheeled front end loader with horsepower range of 80 to 110. Equipment and power unit costs. Labor not included.	Hours	$53.69	12	$644.28
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	24	$635.04

Practice: 375 - Dust Control from Animal Activity on Open Lot Surfaces

Scenario: #7 - Truck-Mounted Mobile Sprinkler System

Scenario Description:

Use of a mobile truck-mounted sprinkler on a confined animal operation. The specific resource concern to be addressed is "Emissions of Particulate Matter (PM) and PM Precursors".

Before Situation:

The confined beef feedlot does not supply additional moisture to the pens and working alleys. There is a dry, loose manure layer that is subject to animal activity resulting in emissions of particulate matter that cause nuisance dusting or visibility-impairment effects.

After Situation:

A mobile truck-mounted sprinkler is used once per day to provide enough water addition to meet the maximum total daily wet soil evaporation rate, with allowances for moisture input to pens/working alleys from animal manure and urine. The application is intended to avoid excessive overlap and over-application of water. Associated practices include 436 - Irrigation Reservoir and 533 - Pumping Plant.

Feature Measure: Pen Surface Area, Including Workin

Scenario Unit: Acres

Scenario Typical Size: 1.0

Scenario Total Cost: $1,949.10

Scenario Cost/Unit: $1,949.10

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	365	$1,949.10

Practice: 375 - Dust Control from Animal Activity on Open Lot Surfaces

Scenario: #11 - Manure Harvest-1 per Year and Truck-Mounted Mobile Sprinkler System

Scenario Description:

Combination of removal of loose, dry layer of manure from a confined animal operation once per year in addition to a regular annual manure clean-out and use of a mobile truck-mounted sprinkler on a confined animal operation. The specific resource concern to be addressed is "Emissions of Particulate Matter (PM) and PM Precursors".

Before Situation:

The confined animal operation conducts a manure clean-out once per year and does not supply additional moisture to the pens and working alleys. There is a dry, loose manure layer that is subject to animal activity resulting in emissions of particulate matter that cause nuisance dusting or visibility-impairment effects.

After Situation:

In addition to the annual manure clean-out, an additional manure harvesting removes the dry, loose manure layer from the pens and working alleys. This manure harvesting will leave a 1-2 inch layer of well-compacted manure above the mineral soil and a smooth pen/alley surface to deter ponding of moisture. A mobile truck-mounted sprinkler is used once per day to provide enough water addition to meet the maximum total daily wet soil evaporation rate, with allowances for moisture input to pens/working alleys from animal manure and urine. The application is intended to avoid excessive overlap and over-application of water. Associated practices include 436 - Irrigation Reservoir and 533 - Pumping Plant.

Feature Measure: Pen Surface Area, Including Workin

Scenario Unit: Acres

Scenario Typical Size: 1.0

Scenario Total Cost: $2,409.57

Scenario Cost/Unit: $2,409.57

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	365	$1,949.10
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$46.88	3	$140.64
Front End Loader, 95 HP	1327	Wheeled front end loader with horsepower range of 80 to 110. Equipment and power unit costs. Labor not included.	Hours	$53.69	3	$161.07
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	6	$158.76

Practice: 375 - Dust Control from Animal Activity on Open Lot Surfaces

Scenario: #15 - Manure Harvest-2 per Year and Truck-Mounted Mobile Sprinkler System

Scenario Description:

Combination of removal of loose, dry layer of manure from a confined animal operation twice per year in addition to a regular annual manure clean-out and use of a mobile truck-mounted sprinkler on a confined animal operation. The specific resource concern to be addressed is "Emissions of Particulate Matter (PM) and PM Precursors".

Before Situation:

The confined animal operation conducts a manure clean-out once per year and does not supply additional moisture to the pens and working alleys. There is a dry, loose manure layer that is subject to animal activity resulting in emissions of particulate matter that cause nuisance dusting or visibility-impairment effects.

After Situation:

In addition to the annual manure clean-out, two additional manure harvesting efforts remove the dry, loose manure layer from the pens and working alleys. Each manure harvesting will leave a 1-2 inch layer of well-compacted manure above the mineral soil and a smooth pen/alley surface to deter ponding of moisture. A mobile truck-mounted sprinkler is used once per day to provide enough water addition to meet the maximum total daily wet soil evaporation rate, with allowances for moisture input to pens/working alleys from animal manure and urine. The application is intended to avoid excessive overlap and over-application of water. Associated practices include 436 - Irrigation Reservoir and 533 - Pumping Plant.

Feature Measure: Pen Surface Area, Including Workin

Scenario Unit: Acres

Scenario Typical Size: 1.0

Scenario Total Cost: $2,870.04

Scenario Cost/Unit: $2,870.04

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	365	$1,949.10
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$46.88	6	$281.28
Front End Loader, 95 HP	1327	Wheeled front end loader with horsepower range of 80 to 110. Equipment and power unit costs. Labor not included.	Hours	$53.69	6	$322.14
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	12	$317.52

Practice: 375 - Dust Control from Animal Activity on Open Lot Surfaces

Scenario: #19 - Manure Harvest-More Than Twice per Year and Truck-Mounted Mobile Sprinkler System

Scenario Description:

Combination of removal of loose, dry layer of manure from a confined animal operation more than twice per year in addition to a regular annual manure clean-out and use of a mobile truck-mounted sprinkler on a confined animal operation. The specific resource concern to be addressed is "Emissions of Particulate Matter (PM) and PM Precursors".

Before Situation:

The confined animal operation conducts a manure clean-out once per year and does not supply additional moisture to the pens and working alleys. There is a dry, loose manure layer that is subject to animal activity resulting in emissions of particulate matter that cause nuisance dusting or visibility-impairment effects.

After Situation:

In addition to the annual manure clean-out, four additional manure harvesting efforts remove the dry, loose manure layer from the pens and working alleys. Each manure harvesting will leave a 1-2 inch layer of well-compacted manure above the mineral soil and a smooth pen/alley surface to deter ponding of moisture. A mobile truck-mounted sprinkler is used once per day to provide enough water addition to meet the maximum total daily wet soil evaporation rate, with allowances for moisture input to pens/working alleys from animal manure and urine. The application is intended to avoid excessive overlap and over-application of water. Associated practices include 436 - Irrigation Reservoir and 533 - Pumping Plant.

Feature Measure: Pen Surface Area, Including Workin

Scenario Unit: Acres

Scenario Typical Size: 1.0

Scenario Total Cost: $3,790.98

Scenario Cost/Unit: $3,790.98

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	365	$1,949.10
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$46.88	12	$562.56
Front End Loader, 95 HP	1327	Wheeled front end loader with horsepower range of 80 to 110. Equipment and power unit costs. Labor not included.	Hours	$53.69	12	$644.28
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	24	$635.04

Practice: 376 - Field Operations Emissions Reduction

Scenario: #1 - One Crop Per Year

Scenario Description:

Utilize equipment that allows a reduction the tillage passes through the field and/or utilizing precision GPS guidance to avoid overlap of tillage passes across the field per crop rotation. Utilize this practice only when residue and STIR values cannot be achieved when using the associated Residue and Tillage Management Practices: 329-No Till or 345-Reduced Tillage to achieve the air quality resource concern. The resource concern addressed is improved air quality by reducing combustion and particulate matter emissions primarily from tillage. The scenario costs are based on tillage equipment or GPS technology to achieve reduce tillage passes.

Before Situation:

Tillage operations are performed individually; each operation requiring a tractor or other power implement to pull the tillage implement resulting in multiple passes across the field. Each pass creates soil particulate emissions contributing to the area's reduced air quality.

After Situation:

A 376 Field Operations Emissions Reduction plan is developed showing a reduced number of field passes across the field (benchmark system compared to the planned system). As a result of applying this practice soil particulates in the air is reduced and the area's air quality is improved.

Feature Measure: Acres Treated

Scenario Unit: Acres

Scenario Typical Size: 40.0

Scenario Total Cost: $604.00

Scenario Cost/Unit: $15.10

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acres	$15.10	40	$604.00

Practice: 376 - Field Operations Emissions Reduction

Scenario: #2 - Two Crops Per Year

Scenario Description:

Utilize equipment that allows a reduction of tillage passes through the field and/or precision GPS guidance to avoid overlap of tillage passes across the field per crop rotation. Utilize this practice only when residue and STIR values cannot be achieved when using the associated Residue and Tillage Management Practices: 329-No Till or 345-Reduced Tillage to achieve the air quality resource concern. The resource concern addressed is improved air quality by reducing combustion and particulate matter emissions primarily from tillage. The scenario cost is based on tillage equipment or GPS technology to achieve reduced tillage passes.

Before Situation:

Tillage operations are performed individually; each operation requiring a tractor or other power implement to pull the tillage implement resulting in multiple passes across the field. Each pass creates soil particulate emissions contributing to the area's reduced air quality.

After Situation:

A 376 Field Operations Emissions Reduction plan is developed showing a reduced number of field passes across the field (benchmark system compared to the planned system). As a result of applying this practice soil particulates in the air is reduced and the area's air quality is improved.

Feature Measure: Acres Treated

Scenario Unit: Acres

Scenario Typical Size: 40.0

Scenario Total Cost: $1,208.00

Scenario Cost/Unit: $30.20

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acres	$15.10	80	$1,208.00

Practice: 378 - Pond

Scenario: #1 - Excavated Pit - Large

Scenario Description:

A low-hazard water impoundment structure on agricultural lands to improve water quality and to provide water for livestock, fish and wildlife, recreation, fire control, crop and orchard irrigation, and other related uses. Pond is created solely by excavation and impounds less than 3 feet against the embankment or spoil. Excavated material is spoiled, not placed in a designed embankment. Earthen spillway is constructed as needed. The resource concerns addressed include inadequate livestock water, excessive suspended sediment and turbidity in surface water, damage from sediment deposition, and reduced capacity of conveyances by sediment deposition.

Before Situation:

Area exists where water could naturally pool or run off to create a pond for livestock, wildlife, fire control or irrigation. Failure of the pond will not result in loss of life; damage to homes, commercial or industrial buildings, main highways, or railroads; or in interruption of the use or service of public utilities.

After Situation:

The typical pond is constructed by excavating 3100 cubic yards and spreading the spoil outside the pool area using a dozer or similar excavation equipment. Vegetation will be completed under critical area planting (342). Other associated practices include 382, 516, 521A, 533, 614, 587, 396.

Feature Measure: Excavated Volume

Scenario Unit: Cubic Yards

Scenario Typical Size: 3,100.0

Scenario Total Cost: $9,176.22

Scenario Cost/Unit: $2.96

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$96.65	40	$3,866.00
Front End Loader, 95 HP	1327	Wheeled front end loader with horsepower range of 80 to 110. Equipment and power unit costs. Labor not included.	Hours	$53.69	40	$2,147.60
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	80	$2,691.20
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 378 - Pond

Scenario: #2 - Embankment Pond without Pipe

Scenario Description:

A water impoundment structure on agricultural land to improve water quality or to provide water for livestock, fish and wildlife, fire control, and other related uses. An earthen embankment will be constructed with an earthen auxiliary spillway. The resource concerns addressed include inadequate livestock water, excessive suspended sediment and turbidity in surface water, damage from sediment deposition, and reduced capacity of conveyances by sediment deposition.

Before Situation:

Area exists where water could naturally pool or run off to create a pond for livestock, wildlife, and fire control. Failure of the embankment will not result in loss of life or damages of any kind.

After Situation:

The typical pond is constructed by excavating the pool area, constructing the auxiliary spillway, preparing the foundation as designed, and using 8933 cubic yards (200 foot long dam; 20 foot tall) to create an embankment. Cut-off trench using 307 cubic yards (200-foot long with side slopes of 2:1)The product of the storage times the effective height of the dam is less than 3,000. The effective height of the dam is 35 feet or less. The earthen auxiliary spillway will be constructed as designed. No principle spillway pipe will be used. Vegetation will be completed under critical area planting (342). Other associated practices include 382, 516, 521A, 533, 614, 587, 396.

Feature Measure: Embankment Volume

Scenario Unit: Cubic Yards

Scenario Typical Size: 9,240.0

Scenario Total Cost: $32,625.77

Scenario Cost/Unit: $3.53

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$96.65	73.5	$7,103.78
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$46.88	231	$10,829.28
Scraper, pull, 7 CY	1206	Pull type earthmoving scraper with 7 CY capacity. Does not include pulling equipment or labor. Add Tractor or Dozer, 160 HP typically required for single scraper.	Hours	$16.20	231	$3,742.20
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	304.5	$10,243.38
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	3	$707.13

Practice: 378 - Pond

Scenario: #3 - Embankment Pond with Pipe

Scenario Description:

A water impoundment structure on agricultural land to improve water quality or to provide water for livestock, fish and wildlife, fire control, and other related uses. An earthen embankment will be constructed with an earthen auxiliary spillway. The resource concerns addressed include inadequate livestock water, excessive suspended sediment and turbidity in surface water, damage from sediment deposition, and reduced capacity of conveyances by sediment deposition.

Before Situation:

Area exists where water could naturally pool or run off to create a pond for livestock, wildlife, and fire control. Failure of the embankment will not result in loss of life or damages of any kind.

After Situation:

The typical pond is constructed by excavating the pool area, constructing the auxiliary spillway, preparing the foundation as designed, and using 8933 cubic yards (200 foot long dam; 20 foot tall) to create an embankment. Cut-off trench using 307 cubic yards (200-foot long with side slopes of 2:1)The product of the storage times the effective height of the dam is less than 3,000. The effective height of the dam is 35 feet or less. The earthen auxiliary spillway will be constructed as designed. Vegetation will be completed under critical area planting (342). Other associated practices include 382, 516, 521A, 533, 614, 587, 396.

Feature Measure: Embankment Volume

Scenario Unit: Cubic Yards

Scenario Typical Size: 9,240.0

Scenario Total Cost: $54,644.31

Scenario Cost/Unit: $5.91

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$494.40	1	$494.40
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	25.83	$53.73
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$5.40	43.33	$233.98
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$29.47	10	$294.70
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$96.65	73.5	$7,103.78
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$46.88	231	$10,829.28
Scraper, pull, 7 CY	1206	Pull type earthmoving scraper with 7 CY capacity. Does not include pulling equipment or labor. Add Tractor or Dozer, 160 HP typically required for single scraper.	Hours	$16.20	231	$3,742.20
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	250	$8,530.00
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	256	$6,192.64
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	10	$264.60
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	304.5	$10,243.38
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic Yards	$28.74	5.85	$168.13
Trash Guard, metal	1608	Trash Guard, fabricated-steel, includes materials, equipment, and labor to transport and place Conical shaped trash guard for drop inlet spillway. Typically fabricated of CMP and steel. Includes materials, equipment, and labor to fabricate and transport.	Pound	$2.63	258	$678.54
Pipe, CMP, 30 in., 16 Gauge	1742	30 inch Corrugated Metal Pipe, Galvanized, Uncoated, 16 gage. Material cost only.	Feet	$33.08	15	$496.20

Pipe, CMP, 18 in., 16 Gauge	1743	18 inch Corrugated Metal Pipe, Galvanized, Uncoated, 16 gage. Material cost only.	Feet	$20.68	165	$3,412.20
Screw gate, cast iron, 18 in. diameter, 10/0 head	1917	18 inch diameter cast iron screw (canal) gate rated at 10 seating head 0 feet unseating head. Materials only.	Each	$1,069.25	1	$1,069.25
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	2	$130.18
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	3	$707.13

Practice: 378 - Pond

Scenario: #66 - Excavated Pit - Small

Scenario Description:

A low-hazard water impoundment structure on agricultural lands to improve water quality and to provide water for livestock, fish and wildlife, recreation, fire control, crop and orchard irrigation, and other related uses. Pond is created solely by excavation and impounds less than 3 feet against the embankment or spoil. Excavated material is spoiled, not placed in a designed embankment. Earthen spillway is constructed as needed. The resource concerns addressed include inadequate livestock water, excessive suspended sediment and turbidity in surface water, damage from sediment deposition, and reduced capacity of conveyances by sediment deposition.

Before Situation:

Area exists where water could naturally pool or run off to create a pond for livestock, wildlife, fire control or irrigation. Failure of the pond will not result in loss of life; damage to homes, commercial or industrial buildings, main highways, or railroads; or in interruption of the use or service of public utilities.

After Situation:

The typical pond is constructed by excavating 1000 cubic yards and spreading the spoil outside the pool area using a dozer or similar excavation equipment. Vegetation will be completed under critical area planting (342). Other associated practices include 382, 516, 521A, 533, 614, 587, 396.

Feature Measure: Excavated Volume

Scenario Unit: Cubic Yards

Scenario Typical Size: 1,000.0

Scenario Total Cost: $5,911.92

Scenario Cost/Unit: $5.91

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$96.65	25	$2,416.25
Front End Loader, 95 HP	1327	Wheeled front end loader with horsepower range of 80 to 110. Equipment and power unit costs. Labor not included.	Hours	$53.69	25	$1,342.25
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	50	$1,682.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 379 - Multi-Story Cropping

Scenario: #1 - Tree Planting (native or non-native)

Scenario Description:

Native or non-native trees are planted to enhance existing agroforest conditions or develop an agroforest on cropland where shrubs, trees, and/or dwarf trees will grow. Resource concerns are degraded plant condition - Inadequate structure and composition, and excessive plant pest pressure (invasive species); Inadequate habitat for fish and wildlife - habitat degredation; and soil erosion - sheet and rill; .

Before Situation:

The agroforest lacks an overstory of trees, and that is negatively affecting existing plants growing on the site. Other shrub species exist and landowner desires to establish a forest overstory improve growing conditions and diversity. Wildlife species are also negatively impacted due to no connectivity to forests. Production and quality of agroforest products are less than desirable. Full sunlight exposure affects shrub health. Ground cover is lacking and sheet and rill erosion occurs during hard rainfall events. Exotic/invasive plants are an issue.

After Situation:

The typical Agroforest is <1ac to 5 ac, 2 ac is average. Native or non-native trees were planted that will grow and provide shade for the existing managed shrubs and/or trees and to create habitat that will benefit terrestrial species. Tree leaves will also provide ground cover, organic matter and wood products.

Feature Measure: Each

Scenario Unit: Each

Scenario Typical Size: 200.0

Scenario Total Cost: $2,209.00

Scenario Cost/Unit: $11.05

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	12	$290.28
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	8	$362.72
Materials						
Tree, Hardwood, Potted, Small	1529	Potted hardwood seedling, 1 quart to 1 gallon. Includes materials and shipping only.	Each	$7.78	200	$1,556.00

Practice: 379 - Multi-Story Cropping

Scenario: #3 - Native Shrub Planting (native or non-native)

Scenario Description:

Native or non-native shrubs are planted to enhance the current agroforest conditions. The land management goal is to diversify understory species that provide dual benefit - for the landowner and native wildlife species. Resource concerns that need to be addressed are degraded plant condition - Inadequate structure and composition, Undesirable plant productivity and health.

Before Situation:

Current setting is a single story forest, either monoculture or multi-culture, that is lacking desirable understory species. The understory may be comprised of introduced grasses, or unwanted, noxious, and/or invasive species. The current understory vegetation provides little habitat value for native wildlife species, and may encourage non-native specie use.

After Situation:

The agroforest is small in size - <1 to 5 acres, 2 is average. Established shrubs enhance economic opportunities along with diversifying the understory of a single or multi-story agroforest improving the overall plant diversity of the landscape. Additional canopy cover reduces rain drop impact on the soil, and leaf litter decomposes on site improving soil conditions. Some trees in the overstory may be removed to match sunlight requirements of newly established shrubs.

Feature Measure: Each

Scenario Unit: Each

Scenario Typical Size: 200.0

Scenario Total Cost: $1,935.00

Scenario Cost/Unit: $9.68

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	12	$290.28
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	8	$362.72
Materials						
Shrub, Potted, Small	1524	Potted shrub seedling, 1 quart to 1 gallon. Includes materials and shipping only.	Each	$6.41	200	$1,282.00

Practice: 380 - Windbreak/Shelterbelt Establishment

Scenario: #1 - 1 row windbreak, shrubs, hand planted

Scenario Description:

Single 500 foot row of shrubs for wind protection, wildlife habitat, or snow management. Shrubs planted by hand 4 feet apart. This practice is typically applied to crop, pasture or range lands. Resource Concerns to be addressed may include: Soil Erosion (wind); Excess/Insufficient Water (drifted snow, inefficient moisture management); Water Quality Degradation (excess nutrients in surface waters, excessive sediment in surface waters,); Degraded Plant Condition (undesirable plant productivity and health); Inadequate habitat for Fish and Wildlife (food, cover/shelter, continuity); Inefficient Energy Use (facilities, farming/ranching practices and field operations).

Before Situation:

Agricultural field, livestock paddock, feedlot or farmstead needing protection from wind, additional wildlife food and cover, or management of snow deposition

After Situation:

Wind velocity suitably reduced to reduce soil erosion, or to manage snow deposition. Additional wildlife food and cover.

Feature Measure: length of windbreak row(s)

Scenario Unit: Feet

Scenario Typical Size: 500.0

Scenario Total Cost: $750.31

Scenario Cost/Unit: $1.50

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.37	334	$457.58
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	2	$44.58
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$11.47	2	$22.94
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	2	$48.38
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	2	$90.68
Materials						
Shrub, Seedling, Small	1506	Bare root shrub seedling, 6 to 18 inches tall, includes tropical containerized seedlings less than 10 cubic inches. Includes materials and shipping only.	Each	$0.67	125	$83.75
Wire flags	1586	Small vinyl flags attached to wire stakes, typically, 36 in. in length, for marking tree rows	Each	$0.12	20	$2.40

Practice: 380 - Windbreak/Shelterbelt Establishment

Scenario: #2 - 1 row windbreak, trees, hand planted

Scenario Description:

Single 500 foot row of conifer tree seedlings for wind protection, wildlife habitat, or snow management. Trees planted by hand 10 feet apart. This practice is typically applied to crop, pasture or range lands. Resource Concerns to be addressed may include: Soil Erosion (wind); Excess/Insufficient Water (drifted snow, inefficient moisture management); Water Quality Degradation (excess nutrients in surface waters, excessive sediment in surface waters,); Degraded Plant Condition (undesirable plant productivity and health); Inadequate habitat for Fish and Wildlife (food, cover/shelter, continuity); Inefficient Energy Use (facilities, farming/ranching practices and field operations).

Before Situation:

Agricultural field, livestock paddock, feedlot or farmstead needing protection from wind, additional wildlife food and cover, or management of snow deposition

After Situation:

Wind velocity suitably reduced to reduce soil erosion, or to manage snow deposition. Additional wildlife food and cover.

Feature Measure: length of windbreak row(s)

Scenario Unit: Feet

Scenario Typical Size: 500.0

Scenario Total Cost: $606.27

Scenario Cost/Unit: $1.21

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.37	334	$457.58
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	1	$22.29
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$11.47	1	$11.47
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	1	$24.19
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	1	$45.34
Materials						
Tree, Conifer, Seedling, Medium	1514	Containerized conifer seedlings, 8 or 10 cubic inches; or bare root conifer seedlings 1+1 (two-year old seedlings that grew one year in the original seedbed and another year in a transplant bed), or bare root seedlings 2+0 (two-year old seedlings grown in their original seedbed). Includes materials and shipping only.	Each	$0.86	50	$43.00
Wire flags	1586	Small vinyl flags attached to wire stakes, typically, 36 in. in length, for marking tree rows	Each	$0.12	20	$2.40

Practice: 380 - Windbreak/Shelterbelt Establishment

Scenario: #3 - 2-row windbreak, shrubs, machine planted

Scenario Description:

Two 500 foot rows of shrubs for wind protection, energy conservation, wildlife habitat, air quality, snow management or to provide a visual screen. Shrubs planted with a tree planting machine 4 feet apart in the row with rows 16 feet apart. This practice is typically applied to crop, pasture or range lands. Resource Concerns to be addressed include: Soil Erosion (wind); Excess/Insufficient Water (drifted snow, inefficient moisture management); Water Quality Degradation (excess nutrients in surface waters, pesticides transported to surface waters, excessive sediment in surface waters,); Degraded Plant Condition (undesirable plant productivity and health); Inadequate habitat for Fish and Wildlife (food, cover/shelter, continuity); Livestock Production Limitation (inadequate shelter); Air Quality Impacts (emission of particulate matter, objectionable odors); Inefficient Energy Use (facilities, farming/ranching practices and field operations).

Before Situation:

Agricultural field, livestock paddock, feedlot or farmstead needing protection from wind, additional wildlife food and cover, odor mitigation, visual screen or management of snow deposition

After Situation:

Wind velocity suitably reduced to reduce soil erosion, energy loss or to manage snow deposition. Additional wildlife food and cover, mixing of odor plumes and visual screening.

Feature Measure: length of windbreak row(s)

Scenario Unit: Feet

Scenario Typical Size: 500.0

Scenario Total Cost: $1,231.16

Scenario Cost/Unit: $2.46

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.37	667	$913.79
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	1	$22.29
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$21.30	1	$21.30
Mechanical tree planter	1600	Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor.	Hours	$5.49	1	$5.49
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	1	$24.19
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	1	$26.46
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	1	$45.34
Materials						
Shrub, Seedling, Small	1506	Bare root shrub seedling, 6 to 18 inches tall, includes tropical containerized seedlings less than 10 cubic inches. Includes materials and shipping only.	Each	$0.67	250	$167.50
Wire flags	1586	Small vinyl flags attached to wire stakes, typically, 36 in. in length, for marking tree rows	Each	$0.12	40	$4.80

Practice: 380 - Windbreak/Shelterbelt Establishment

Scenario: #4 - 2-row windbreak, trees, machine planted

Scenario Description:

Two 500 foot rows of hardwood trees for wind protection, energy conservation, wildlife habitat, air quality, snow management or to provide a visual screen. Trees planted with a tree planting machine 10 feet apart in the row with rows 16 feet apart. Herbivores (deer, rabbits, etc.) are NOT expected to browse tree seedlings, tree protection is not needed. This practice is typically applied to crop, pasture or range lands. Resource Concerns to be addressed include: Soil Erosion (wind); Excess/Insufficient Water (drifted snow, inefficient moisture management); Water Quality Degradation (excess nutrients in surface waters, pesticides transported to surface waters, excessive sediment in surface waters,); Degraded Plant Condition (undesirable plant productivity and health); Inadequate habitat for Fish and Wildlife (food, cover/shelter, continuity); Livestock Production Limitation (inadequate shelter); Air Quality Impacts (emission of particulate matter, objectionable odors); Inefficient Energy Use (facilities, farming/ranching practices and field operations).

Before Situation:

Agricultural field, livestock paddock, feedlot or farmstead needing protection from wind, additional wildlife food and cover, odor mitigation, visual screen or management of snow deposition

After Situation:

Wind velocity suitably reduced to reduce soil erosion, energy loss or to manage snow deposition. Additional wildlife food and cover, mixing of odor plumes and visual screening.

Feature Measure: length of windbreak row(s)

Scenario Unit: Feet

Scenario Typical Size: 500.0

Scenario Total Cost: $1,286.73

Scenario Cost/Unit: $2.57

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.37	667	$913.79
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	2	$44.58
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$21.30	2	$42.60
Mechanical tree planter	1600	Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor.	Hours	$5.49	2	$10.98
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	2	$48.38
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	2	$52.92
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	2	$90.68
Materials						
Tree, Hardwood, Seedling, Small	1509	Bare root hardwood seedlings 6 to 18 inches tall; includes tropical containerized seedlings of 8 cubic inches or smaller. Includes materials and shipping only.	Each	$0.78	100	$78.00
Wire flags	1586	Small vinyl flags attached to wire stakes, typically, 36 in. in length, for marking tree rows	Each	$0.12	40	$4.80

Practice: 380 - Windbreak/Shelterbelt Establishment

Scenario: #5 - 2-row windbreak, trees, machine planted, with tubes

Scenario Description:

Two 500 foot rows of hardwood tree seedlings for wind protection, energy conservation, wildlife habitat, air quality, snow management or to provide a visual screen. Trees planted with a tree planting machine 10 feet apart in the row with rows 16 feet apart. Herbivore (deer, rabbits, etc.) damage is likely, so each tree must be protected with a rigid tube tree shelter. This practice is typically applied to crop, pasture or range lands. Resource Concerns to be addressed include: Soil Erosion (wind); Excess/Insufficient Water (drifted snow, inefficient moisture management); Water Quality Degradation (excess nutrients in surface waters, pesticides transported to surface waters, excessive sediment in surface waters,); Degraded Plant Condition (undesirable plant productivity and health); Inadequate habitat for Fish and Wildlife (food, cover/shelter, continuity); Livestock Production Limitation (inadequate shelter); Air Quality Impacts (emission of particulate matter, objectionable odors); Inefficient Energy Use (facilities, farming/ranching practices and field operations).

Before Situation:

Agricultural field, livestock paddock, feedlot or farmstead needing protection from wind, additional wildlife food and cover, odor mitigation, visual screen or management of snow deposition

After Situation:

Wind velocity suitably reduced to reduce soil erosion, energy loss or to manage snow deposition. Additional wildlife food and cover, mixing of odor plumes and visual screening.

Feature Measure: length of windbreak row(s)

Scenario Unit: Feet

Scenario Typical Size: 500.0

Scenario Total Cost: $1,891.73

Scenario Cost/Unit: $3.78

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.37	667	$913.79
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	2	$44.58
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$21.30	2	$42.60
Mechanical tree planter	1600	Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor.	Hours	$5.49	2	$10.98
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	2	$48.38
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	2	$52.92
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	2	$90.68
Materials						
Tree, Hardwood, Seedling, Small	1509	Bare root hardwood seedlings 6 to 18 inches tall; includes tropical containerized seedlings of 8 cubic inches or smaller. Includes materials and shipping only.	Each	$0.78	100	$78.00
Tree shelter, solid tube type, 5 in. x 48 in.	1571	5 inch x 48 inch tree tube for protection from animal damage. Materials only.	Each	$3.71	100	$371.00
Cable ties, plastic	1575	Plastic cable ties (typ. 8-12 in.) to assist in securing items. Materials only.	Each	$0.06	150	$9.00
Stakes, wood, 3/4 in. x 3/4 in. x 60 in.	1583	3/4 in. x 3/4 in. x 60 in. wood stakes to fasten items in place. Includes materials only.	Each	$1.50	150	$225.00
Wire flags	1586	Small vinyl flags attached to wire stakes, typically, 36 in. in length, for marking tree rows	Each	$0.12	40	$4.80

Practice: 380 - Windbreak/Shelterbelt Establishment

Scenario: #6 - 3 or more row windbreak, shrub, machine planted

Scenario Description:

Three or more 500 foot rows of shrubs for wind protection, energy conservation, wildlife habitat, air quality, snow management. Shrubs planted with a tree planting machine, 4 feet apart in the row with rows 16 feet apart. This practice is typically applied to crop, pasture or range lands. Resource Concerns to be addressed include: Soil Erosion (wind); Excess/Insufficient Water (drifted snow, inefficient moisture management); Water Quality Degradation (excess nutrients in surface waters, pesticides transported to surface waters, excessive sediment in surface waters,); Degraded Plant Condition (undesirable plant productivity and health); Inadequate habitat for Fish and Wildlife (food, cover/shelter, continuity); Livestock Production Limitation (inadequate shelter); Air Quality Impacts (emission of particulate matter, objectionable odors); Inefficient Energy Use (facilities, farming/ranching practices and field operations).

Before Situation:

Agricultural field, livestock paddock, feedlot or farmstead needing protection from wind, additional wildlife food and cover, odor mitigation, visual screening or management of snow deposition

After Situation:

Wind velocity suitably reduced to reduce soil erosion, energy loss or to manage snow deposition. Additional wildlife food and cover, mixing of odor plumes and visual screening.

Feature Measure: length of windbreak row(s)

Scenario Unit: Feet

Scenario Typical Size: 500.0

Scenario Total Cost: $2,063.66

Scenario Cost/Unit: $4.13

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.37	1000	$1,370.00
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	3	$66.87
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$21.30	3	$63.90
Mechanical tree planter	1600	Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor.	Hours	$5.49	3	$16.47
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	3	$72.57
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	3	$79.38
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	3	$136.02
Materials						
Shrub, Seedling, Small	1506	Bare root shrub seedling, 6 to 18 inches tall, includes tropical containerized seedlings less than 10 cubic inches. Includes materials and shipping only.	Each	$0.67	375	$251.25
Wire flags	1586	Small vinyl flags attached to wire stakes, typically, 36 in. in length, for marking tree rows	Each	$0.12	60	$7.20

Practice: 380 - Windbreak/Shelterbelt Establishment

Scenario: #7 - 3 or more tree rows machine planted windbreak

Scenario Description:

Three or more 500 foot rows of trees for wind protection, energy conservation, wildlife habitat, air quality, snow management or to provide a visual screen. The outside rows are conifers the inside row(s) are hardwoods. Trees 10 feet apart with rows 16 feet apart, planted with a tree planting machine. Herbivores are not expected to browse planted seedlings, so tree shelters are not needed. This practice is typically applied to crop, pasture or range lands. Resource Concerns to be addressed include: Soil Erosion (wind); Excess/Insufficient Water (drifted snow, inefficient moisture management); Water Quality Degradation (excess nutrients in surface waters, pesticides transported to surface waters, excessive sediment in surface waters,); Degraded Plant Condition (undesirable plant productivity and health); Inadequate habitat for Fish and Wildlife (food, cover/shelter, continuity); Livestock Production Limitation (inadequate shelter); Air Quality Impacts (emission of particulate matter, objectionable odors); Inefficient Energy Use (facilities, farming/ranching practices and field operations).

Before Situation:

Agricultural field, livestock paddock, feedlot or farmstead needing protection from wind, additional wildlife food and cover, odor mitigation, visual screening or management of snow deposition

After Situation:

Wind velocity suitably reduced to reduce soil erosion, energy loss or to manage snow deposition. Additional wildlife food and cover, mixing of odor plumes and visual screening.

Feature Measure: length of windbreak row(s)

Scenario Unit: Feet

Scenario Typical Size: 500.0

Scenario Total Cost: $1,737.02

Scenario Cost/Unit: $3.47

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.37	1000	$1,370.00
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	2	$44.58
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$21.30	2	$42.60
Mechanical tree planter	1600	Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor.	Hours	$5.49	2	$10.98
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	2	$48.38
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	2	$90.68
Materials						
Tree, Hardwood, Seedling, Small	1509	Bare root hardwood seedlings 6 to 18 inches tall; includes tropical containerized seedlings of 8 cubic inches or smaller. Includes materials and shipping only.	Each	$0.78	50	$39.00
Tree, Conifer, Seedling, Medium	1514	Containerized conifer seedlings, 8 or 10 cubic inches; or bare root conifer seedlings 1+1 (two-year old seedlings that grew one year in the original seedbed and another year in a transplant bed), or bare root seedlings 2+0 (two-year old seedlings grown in their original seedbed). Includes materials and shipping only.	Each	$0.86	100	$86.00
Wire flags	1586	Small vinyl flags attached to wire stakes, typically, 36 in. in length, for marking tree rows	Each	$0.12	40	$4.80

Practice: 380 - Windbreak/Shelterbelt Establishment

Scenario: #8 - 3 or more row windbreak, trees, machine planted, with tubes

Scenario Description:

Three or more 500 foot rows of hardwood trees for wind protection, energy conservation, wildlife habitat, air quality, snow management or to provide a visual screen. Trees planted with a tree planting machine 10 feet apart in the row with rows 16 feet apart. Herbivore (deer, rabbits, etc.) damage is likely, so each tree must be protected with a rigid tube tree shelter. This practice is typically applied to crop, pasture or range lands. Resource Concerns to be addressed include: Soil Erosion (wind); Excess/Insufficient Water (drifted snow, inefficient moisture management); Water Quality Degradation (excess nutrients in surface waters, pesticides transported to surface waters, excessive sediment in surface waters,); Degraded Plant Condition (undesirable plant productivity and health); Inadequate habitat for Fish and Wildlife (food, cover/shelter, continuity); Livestock Production Limitation (inadequate shelter); Air Quality Impacts (emission of particulate matter, objectionable odors); Inefficient Energy Use (facilities, farming/ranching practices and field operations).

Before Situation:

Agricultural field, livestock paddock, feedlot or farmstead needing protection from wind, additional wildlife food and cover, odor mitigation, visual screen or management of snow deposition

After Situation:

Wind velocity suitably reduced to reduce soil erosion, energy loss or to manage snow deposition. Additional wildlife food and cover, mixing of odor plumes and visual screening.

Feature Measure: length of windbreak row(s)

Scenario Unit: Feet

Scenario Typical Size: 500.0

Scenario Total Cost: $2,574.84

Scenario Cost/Unit: $5.15

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.37	1000	$1,370.00
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	2	$44.58
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$21.30	2	$42.60
Mechanical tree planter	1600	Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor.	Hours	$5.49	2	$10.98
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	2	$48.38
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	2	$52.92
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	2	$90.68
Materials						
Tree, Hardwood, Seedling, Small	1509	Bare root hardwood seedlings 6 to 18 inches tall; includes tropical containerized seedlings of 8 cubic inches or smaller. Includes materials and shipping only.	Each	$0.78	150	$117.00
Tree shelter, solid tube type, 5 in. x 48 in.	1571	5 inch x 48 inch tree tube for protection from animal damage. Materials only.	Each	$3.71	150	$556.50
Cable ties, plastic	1575	Plastic cable ties (typ. 8-12 in.) to assist in securing items. Materials only.	Each	$0.06	150	$9.00
Stakes, wood, 3/4 in. x 3/4 in. x 60 in.	1583	3/4 in. x 3/4 in. x 60 in. wood stakes to fasten items in place. Includes materials only.	Each	$1.50	150	$225.00
Wire flags	1586	Small vinyl flags attached to wire stakes, typically, 36 in. in length, for marking tree rows	Each	$0.12	60	$7.20

Practice: 380 - Windbreak/Shelterbelt Establishment

Scenario: #9 - 2-row windbreak, trees, machine planted, no fabric

Scenario Description:

Two 500 foot rows of hardwood trees for wind protection, energy conservation, wildlife habitat, air quality, snow management or to provide a visual screen. Trees planted with a tree planting machine 10 feet apart in the row with rows 16 feet apart. Herbivores (deer, rabbits, etc.) are NOT expected to browse tree seedlings, tree protection is not needed. This practice is typically applied to crop, pasture or range lands. Resource Concerns to be addressed include: Soil Erosion (wind); Excess/Insufficient Water (drifted snow, inefficient moisture management); Water Quality Degradation (excess nutrients in surface waters, pesticides transported to surface waters, excessive sediment in surface waters,); Degraded Plant Condition (undesirable plant productivity and health); Inadequate habitat for Fish and Wildlife (food, cover/shelter, continuity); Livestock Production Limitation (inadequate shelter); Air Quality Impacts (emission of particulate matter, objectionable odors); Inefficient Energy Use (facilities, farming/ranching practices and field operations).

Before Situation:

Agricultural field, livestock paddock, feedlot or farmstead needing protection from wind, additional wildlife food and cover, odor mitigation, visual screen or management of snow deposition

After Situation:

Wind velocity suitably reduced to reduce soil erosion, energy loss or to manage snow deposition. Additional wildlife food and cover, mixing of odor plumes and visual screening.

Feature Measure: length of windbreak row(s)

Scenario Unit: Feet

Scenario Typical Size: 500.0

Scenario Total Cost: $372.94

Scenario Cost/Unit: $0.75

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	2	$44.58
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$21.30	2	$42.60
Mechanical tree planter	1600	Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor.	Hours	$5.49	2	$10.98
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	2	$48.38
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	2	$52.92
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	2	$90.68
Materials						
Tree, Hardwood, Seedling, Small	1509	Bare root hardwood seedlings 6 to 18 inches tall; includes tropical containerized seedlings of 8 cubic inches or smaller. Includes materials and shipping only.	Each	$0.78	100	$78.00
Wire flags	1586	Small vinyl flags attached to wire stakes, typically, 36 in. in length, for marking tree rows	Each	$0.12	40	$4.80

Practice: 381 - Silvopasture

Scenario: #1 - Commercial Thin & Est NTV Grass

Scenario Description:
Commercial thinning of an existing stand of trees followed by establishment of native grasses.

Before Situation:
10-acre pine plantation that is overstocked, with a basal area of 100 sq. ft. per acre. There is very little available forage for livestock, due to the dense shade of the tree canopy. Resource Concerns include Degraded Plant Condition - Undesirable Plant Productivity and Health, Inadequate Structure and Composition, Wildfire Hazard, Excessive Biomass Accumulation; Livestock Production Limitation - Inadequate Feed and Forage, and Inadequate Livestock Shelter.

After Situation:
The stand is thinned commercially to a basal area of 50 sq. ft. per acre, which will allow adequate sunlight to the forest floor for grass production, yet still provide shade and some protection from the elements for livestock and wildlife. Since thinning is done commercially, no harvesting costs are incurred. Debris is removed, all tree cutting will leave the shortest possible stump height. The soil is prepared for planting using chemical and mechanical means, then a mix of native warm-season grasses will be established, providing forage to livestock and wildlife. All Resource Concerns listed above are adressed.

Feature Measure: Acres of silvopasture established

Scenario Unit: Acres

Scenario Typical Size: 10.0

Scenario Total Cost: $4,191.78

Scenario Cost/Unit: $419.18

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	10	$98.90
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	10	$53.40
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.12	10	$61.20
Lime application	953	Lime application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.57	10	$75.70
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	10	$203.10
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acres	$8.00	10	$80.00
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	8	$889.68
Materials						
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.52	500	$260.00
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.35	500	$175.00
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$50.08	20	$1,001.60
Tree Marking Paint	313	Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only.	Acres	$8.78	10	$87.80
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$9.21	10	$92.10
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$111.33	10	$1,113.30

Practice: 381 - Silvopasture

Scenario: #2 - Commercial thinning & establishment of introduced grasses.

Scenario Description:

Commercial thinning of an existing stand of trees followed by establishment of introduced grasses.

Before Situation:

10-acre pine plantation that is overstocked, with a basal area of 100 sq. ft. per acre. There is very little available forage for livestock, due to the dense shade of the tree canopy. Resource Concerns include Degraded Plant Condition - Undesirable Plant Productivity and Health, Inadequate Structure and Composition, Wildfire Hazard, Excessive Biomass Accumulation; Livestock Production Limitation - Inadequate Feed and Forage, and Inadequate Livestock Shelter.

After Situation:

The stand is thinned commercially to a basal area of 50 sq. ft. per acre, which will allow adequate sunlight to the forest floor for grass production, yet still provide shade and some protection from the elements for livestock and wildlife. Since thinning is done commercially, no harvesting costs are incurred. Debris is removed, all tree cutting will leave the shortest possible stump height. The soil is prepared for planting using chemical and mechanical means, then a mix of cool-season grasses and legumes will be established, providing forage to livestock and wildlife. All Resource Concerns listed above are adressed.

Feature Measure: Acres of silvopasture established

Scenario Unit: Acres

Scenario Typical Size: 10.0

Scenario Total Cost: $3,385.98

Scenario Cost/Unit: $338.60

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	10	$98.90
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	10	$53.40
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.12	10	$61.20
Lime application	953	Lime application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.57	10	$75.70
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	10	$203.10
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acres	$8.00	10	$80.00
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	8	$889.68
Materials						
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.52	500	$260.00
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.35	500	$175.00
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$50.08	20	$1,001.60
Tree Marking Paint	313	Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only.	Acres	$8.78	10	$87.80
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$9.21	10	$92.10
Introduced Perennial Grasses, Legumes and/or Forbs, Low Density	2747	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$30.75	10	$307.50

Practice: 381 - Silvopasture

Scenario: #3 - Non-commercial thinning & establishment of native grasses.

Scenario Description:

Non-commercial thinning of an existing stand of trees followed by establishment of native grasses.

Before Situation:

10-acre pine plantation that is overstocked, with a basal area of 100 sq. ft. per acre. There is very little available forage for livestock, due to the dense shade of the tree canopy. Resource Concerns include Degraded Plant Condition - Undesirable Plant Productivity and Health, Inadequate Structure and Composition, Wildfire Hazard, Excessive Biomass Accumulation; Livestock Production Limitation - Inadequate Feed and Forage, and Inadequate Livestock Shelter.

After Situation:

The stand is thinned non-commercially to a basal area of 50 sq. ft. per acre, which will allow adequate sunlight to the forest floor for grass production, yet still provide shade and some protection from the elements for livestock and wildlife. Debris is removed, all tree cutting will leave the shortest possible stump height. The soil is prepared for planting using chemical and mechanical means, then a mix of native warm-season grasses will be established, providing forage to livestock and wildlife. All Resource Concerns listed above are adressed.

Feature Measure: Acres of silvopasture established

Scenario Unit: Acres

Scenario Typical Size: 10.0

Scenario Total Cost: $6,038.58

Scenario Cost/Unit: $603.86

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.59	60	$395.40
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	10	$98.90
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	10	$53.40
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.12	10	$61.20
Lime application	953	Lime application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.57	10	$75.70
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	10	$203.10
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acres	$8.00	10	$80.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	60	$1,451.40
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	8	$889.68
Materials						
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.52	500	$260.00
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.35	500	$175.00
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$50.08	20	$1,001.60
Tree Marking Paint	313	Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only.	Acres	$8.78	10	$87.80
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$9.21	10	$92.10
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$111.33	10	$1,113.30

Practice: 381 - Silvopasture

Scenario: #4 - Non-commercial thinning & establishment of introduced grasses.

Scenario Description:

Non-commercial thinning of an existing stand of trees followed by establishment of introduced grasses.

Before Situation:

10-acre pine plantation that is overstocked, with a basal area of 100 sq. ft. per acre. There is very little available forage for livestock, due to the dense shade of the tree canopy. Resource Concerns include Degraded Plant Condition - Undesirable Plant Productivity and Health, Inadequate Structure and Composition, Wildfire Hazard, Excessive Biomass Accumulation; Livestock Production Limitation - Inadequate Feed and Forage, and Inadequate Livestock Shelter.

After Situation:

The stand is thinned non-commercially to a basal area of 50 sq. ft. per acre, which will allow adequate sunlight to the forest floor for grass production, yet still provide shade and some protection from the elements for livestock and wildlife. Debris is removed, all tree cutting will leave the shortest possible stump height. The soil is prepared for planting using chemical and mechanical means, then a mix of cool-season grasses and legumes will be established, providing forage to livestock and wildlife. All Resource Concerns listed above are adressed.

Feature Measure: Acres of silvopasture established

Scenario Unit: Acres

Scenario Typical Size: 10.0

Scenario Total Cost: $5,232.78

Scenario Cost/Unit: $523.28

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.59	60	$395.40
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	10	$98.90
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	10	$53.40
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.12	10	$61.20
Lime application	953	Lime application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.57	10	$75.70
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	10	$203.10
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acres	$8.00	10	$80.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	60	$1,451.40
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	8	$889.68
Materials						
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.52	500	$260.00
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.35	500	$175.00
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$50.08	20	$1,001.60
Tree Marking Paint	313	Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only.	Acres	$8.78	10	$87.80
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$9.21	10	$92.10
Introduced Perennial Grasses, Legumes and/or Forbs, Low Density	2747	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$30.75	10	$307.50

Practice: 381 - Silvopasture

Scenario: #5 - Native grasses established in existing tree stand

Scenario Description:

Establishment of native grasses into an existing stand of trees that is already at an adequate density .

Before Situation:

10-acre pine plantation woodlot that has a basal area of 50 sq. ft. per acre. There is very little available forage for livestock, due to undesirable species in the understory. Resource Concerns include Degraded Plant Condition - Undesirable Plant Productivity and Health, Inadequate Structure and Composition; Livestock Production Limitation - Inadequate Feed and Forage.

After Situation:

The soil is prepared for planting using chemical and mechanical means, then a mix of native warm-season grasses will be established, providing forage to livestock and wildlife. All Resource Concerns listed above are adressed.

Feature Measure: Acres of silvopasture established

Scenario Unit: Acres

Scenario Typical Size: 10.0

Scenario Total Cost: $3,214.30

Scenario Cost/Unit: $321.43

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	10	$98.90
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	10	$53.40
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.12	10	$61.20
Lime application	953	Lime application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.57	10	$75.70
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	10	$203.10
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acres	$8.00	10	$80.00
Materials						
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.52	500	$260.00
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.35	500	$175.00
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$50.08	20	$1,001.60
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$9.21	10	$92.10
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$111.33	10	$1,113.30

Practice: 381 - Silvopasture

Scenario: #6 - Introduced grasses established into existing tree stand

Scenario Description:

Establishment of introduced grasses into an existing stand of trees that is already at an adequate density .

Before Situation:

10-acre pine plantation woodlot that has a basal area of 50 sq. ft. per acre. There is very little available forage for livestock, due to undesirable species in the understory. Resource Concerns include Degraded Plant Condition - Undesirable Plant Productivity and Health, Inadequate Structure and Composition; Livestock Production Limitation - Inadequate Feed and Forage.

After Situation:

The soil is prepared for planting using chemical and mechanical means, then a mix of cool-season grasses and legumes will be established, providing forage to livestock and wildlife. All Resource Concerns listed above are adressed.

Feature Measure: Acres of silvopasture established

Scenario Unit: Acres

Scenario Typical Size: 10.0

Scenario Total Cost: $2,246.02

Scenario Cost/Unit: $224.60

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	10	$98.90
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	10	$53.40
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.12	10	$61.20
Lime application	953	Lime application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.57	10	$75.70
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	2	$40.62
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acres	$8.00	10	$80.00
Materials						
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.52	500	$260.00
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.35	500	$175.00
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$50.08	20	$1,001.60
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$9.21	10	$92.10
Introduced Perennial Grasses, Legumes and/or Forbs, Low Density	2747	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$30.75	10	$307.50

Practice: 381 - Silvopasture

Scenario: #7 - Tree and native grass establishment

Scenario Description:

Establishment of trees and native grasses into a field that contains neither suitable forage nor suitable tree cover for a silvopasture system.

Before Situation:

10-acre old field without suitable forage for livestock nor tree cover. There is very little available forage for livestock, due to undesirable species in the understory. Resource Concerns include Degraded Plant Condition - Undesirable Plant Productivity and Health, Inadequate Structure and Composition; Livestock Production Limitation - Inadequate Feed and Forage, and Inadequate Livestock Shelter.

After Situation:

The site will be prepared using chemical and mechanical means, a mix of native warm-season grasses will be established, and then 200 hardwood trees per acre will be planted, providing forage to livestock and wildlife, and, in time, producing a viable wood products crop. Per the conservation practice standard, livestock grazing will be deferred until the trees reach adequate height to resist damage, or use exclusion measures are established. All Resource Concerns listed above are adressed.

Feature Measure: Acres of silvopasture established

Scenario Unit: Acres

Scenario Typical Size: 10.0

Scenario Total Cost: $4,958.98

Scenario Cost/Unit: $495.90

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	10	$98.90
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	10	$53.40
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.12	10	$61.20
Lime application	953	Lime application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.57	10	$75.70
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	2	$40.62
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$21.30	4	$85.20
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acres	$8.00	10	$80.00
Mechanical tree planter	1600	Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor.	Hours	$5.49	4	$21.96
Materials						
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.52	500	$260.00
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.35	500	$175.00
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$50.08	20	$1,001.60
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$9.21	10	$92.10
Tree, Hardwood, Seedling, Small	1509	Bare root hardwood seedlings 6 to 18 inches tall; includes tropical containerized seedlings of 8 cubic inches or smaller. Includes materials and shipping only.	Each	$0.78	2000	$1,560.00
Wire flags	1586	Small vinyl flags attached to wire stakes, typically, 36 in. in length, for marking tree rows	Each	$0.12	2000	$240.00
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$111.33	10	$1,113.30

Practice: 381 - Silvopasture

Scenario: #8 - Tree and introduced grass establishment

Scenario Description:

Establishment of trees and introduced grasses and legumes into a field that contains neither suitable forage nor suitable tree cover for a silvopasture system.

Before Situation:

10-acre old field without suitable forage for livestock nor tree cover. There is very little available forage for livestock, due to undesirable species in the understory. Resource Concerns include Degraded Plant Condition - Undesirable Plant Productivity and Health, Inadequate Structure and Composition; Livestock Production Limitation - Inadequate Feed and Forage, and Inadequate Livestock Shelter.

After Situation:

The site will be prepared using chemical and mechanical means, a mix of cool-season grasses and legumes will be established, and then 200 pine trees per acre will be planted, providing forage to livestock and wildlife, and, in time, producing a viable wood products crop. Per the conservation practice standard, livestock grazing will be deferred until the trees reach adequate height to resist damage, or use exclusion measures are established. All Resource Concerns listed above are adressed.

Feature Measure: Acres of silvopasture established

Scenario Unit: Acres

Scenario Typical Size: 10.0

Scenario Total Cost: $3,613.18

Scenario Cost/Unit: $361.32

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	10	$98.90
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	10	$53.40
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.12	10	$61.20
Lime application	953	Lime application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.57	10	$75.70
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	2	$40.62
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$21.30	4	$85.20
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acres	$8.00	10	$80.00
Mechanical tree planter	1600	Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor.	Hours	$5.49	4	$21.96
Materials						
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.52	500	$260.00
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.35	500	$175.00
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$50.08	20	$1,001.60
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$9.21	10	$92.10
Tree, Conifer, Seedling, Small	1512	Containerized conifer seedlings, 4 or 6 cubic inches; or bare root conifer seedlings 1+0 (one-year old seedlings grown in their original seedbed). Includes materials and shipping only.	Each	$0.51	2000	$1,020.00
Wire flags	1586	Small vinyl flags attached to wire stakes, typically, 36 in. in length, for marking tree rows	Each	$0.12	2000	$240.00
Introduced Perennial Grasses, Legumes and/or Forbs, Low Density	2747	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$30.75	10	$307.50

Practice: 381 - Silvopasture

Scenario: #9 - Tree establishment

Scenario Description:

Establishment of trees into an existing pasture that contains adequate native or introduced forage.

Before Situation:

10-acre pasture with suitable forage for livestock. There is very little protection from the elements (sun, wind, etc.) available to the livestock. Additionally, there are no long-term wood products being produced. Resource Concerns include Degraded Plant Condition - Undesirable Plant Productivity and Health, Inadequate Structure and Composition, Livestock Production Limitation - Inadequate Livestock Shelter.

After Situation:

The site will be prepared using Tree/Shrub Site Preparation (490), if needed, and then 200 pine trees per acre will be planted, providing shade and wind protection to livestock and wildlife, and, in time, producing a viable wood products crop. Per the conservation practice standard, livestock grazing will be deferred until the trees reach adequate height to resist damage, or use exclusion measures are established. All Resource Concerns listed above are adressed.

Feature Measure: Acres of silvopasture established

Scenario Unit: Acres

Scenario Typical Size: 10.0

Scenario Total Cost: $1,428.36

Scenario Cost/Unit: $142.84

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.12	10	$61.20
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$21.30	4	$85.20
Mechanical tree planter	1600	Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor.	Hours	$5.49	4	$21.96
Materials						
Tree, Conifer, Seedling, Small	1512	Containerized conifer seedlings, 4 or 6 cubic inches; or bare root conifer seedlings 1+0 (one-year old seedlings grown in their original seedbed). Includes materials and shipping only.	Each	$0.51	2000	$1,020.00
Wire flags	1586	Small vinyl flags attached to wire stakes, typically, 36 in. in length, for marking tree rows	Each	$0.12	2000	$240.00

Practice: 382 - Fence

Scenario: #1 - Multi Strand Barbed/Smooth Wire

Scenario Description:

Multi-strand, Barbed or Smooth Wire - Installation of fence will allow for implementation of grazing management that allows for an adequate rest and recovery period, protection of sensitive area, improved water quality, reduction of noxious and invasive weeds. Constructed using fencing materials rather than a pre-manufactured gate.

Before Situation:

On grazing lands health and vigor are negatively impacted by poor grazing distribution, timing of grazing and inadequate rest and recovery periods. Water quality is impacted by increased erosion and runoff, cattle access to water bodies is uncontrolled. Reduced vegetative cover increases the opportunity for encroachment of noxious and invasive weeds.

After Situation:

Installation of fence will allow for implementation of grazing management that allows for an adequate rest and recovery period, protection of sensitive area, improved water quality, reduction of noxious and invasive weeds. Fence includes posts, wire, fasteners, gates, etc... Four strand wire is commonly installed. Fence will be installed with wildlife friendly considerations.

Feature Measure: Length of Fence

Scenario Unit: Feet

Scenario Typical Size: 1,320.0

Scenario Total Cost: $2,903.66

Scenario Cost/Unit: $2.20

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hours	$11.75	5	$58.75
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	5	$111.45
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$21.30	5	$106.50
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	33	$798.27
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	5	$132.30
Materials						
Wire, Barbed, Galvanized, 12.5 Gauge, 1,320' roll	1	Galvanized 12.5 gauge, 1,320' roll. Includes materials and shipping only.	Each	$71.04	4	$284.16
Post, Wood, CCA treated, 3-4 in. x 7 ft.	9	Wood Post, Line 3-4 inch dia. X 7 ft., CCA Treated. Includes materials and shipping only.	Each	$7.36	20	$147.20
Post, Wood, CCA treated, 6 in. x 8 ft.	12	Wood Post, End 6 inch dia. X 8 ft., CCA Treated. Includes materials and shipping only.	Each	$17.21	8	$137.68
Post, Steel T, 1.33 lbs, 6'	15	Steel Post, Studded 6' - 1.33 lb. Includes materials and shipping only.	Each	$5.60	90	$504.00
Fence, Wire Assembly, Barbed Wire	30	Brace pins, battens, clips, staples. Includes materials and shipping only.	Feet	$0.19	1320	$250.80
Vinyl Undersill Strips	241	Marking material using the undersill strips of vinyl siding. Priced per foot of fence per each wire. Materials only.	Feet	$0.07	500	$35.00
Gate, Pipe, 12 ft.	1057	6 rail tube gate, 16 gauge. Includes materials and shipping only.	Each	$179.02	1	$179.02
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53

Practice: 382 - Fence

Scenario: #2 - Multi Strand Barbed or smooth Wire Difficult terrain

Scenario Description:

Barbed, Smooth ,or Woven Wire Difficult Installation - Installation of fence in difficult situations will allow for implementation of grazing management that allows for an adequate rest and recovery period, protection of sensitive area, improved water quality, reduction of noxious and invasive weeds. Constructed using fencing materials rather than a pre-manufactured gate.

Before Situation:

On grazing lands health and vigor are negatively impacted by poor grazing distribution, timing of grazing and inadequate rest and recovery periods. Water quality is impacted by increased erosion and runoff, cattle access to water bodies is uncontrolled. Reduced vegetative cover increases the opportunity for encroachment of noxious and invasive weeds. Fence installation conditions are for difficult sites such as poor access, steep slopes, rocky sites, dense brush, wet conditions etc.

After Situation:

Installation of fence will allow for implementation of grazing management that allows for an adequate rest and recovery period, protection of sensitive area, improved water quality, reduction of noxious and invasive weeds. Fence includes posts, wire, fasteners, gates, brace posts, etc... Fence will be installed with wildlife friendly considerations.

Feature Measure: Length of Fence

Scenario Unit: Feet

Scenario Typical Size: 1,320.0

Scenario Total Cost: $3,860.93

Scenario Cost/Unit: $2.92

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hours	$11.75	10	$117.50
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.59	1	$6.59
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	5	$111.45
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$21.30	10	$213.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	60	$1,451.40
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	10	$264.60
Materials						
Wire, Barbed, Galvanized, 12.5 Gauge, 1,320' roll	1	Galvanized 12.5 gauge, 1,320' roll. Includes materials and shipping only.	Each	$71.04	4	$284.16
Post, Wood, CCA treated, 3-4 in. x 7 ft.	9	Wood Post, Line 3-4 inch dia. X 7 ft., CCA Treated. Includes materials and shipping only.	Each	$7.36	20	$147.20
Post, Wood, CCA treated, 6 in. x 8 ft.	12	Wood Post, End 6 inch dia. X 8 ft., CCA Treated. Includes materials and shipping only.	Each	$17.21	8	$137.68
Post, Steel T, 1.33 lbs, 6'	15	Steel Post, Studded 6' - 1.33 lb. Includes materials and shipping only.	Each	$5.60	90	$504.00
Fence, Wire Assembly, Barbed Wire	30	Brace pins, battens, clips, staples. Includes materials and shipping only.	Feet	$0.19	1320	$250.80
Vinyl Undersill Strips	241	Marking material using the undersill strips of vinyl siding. Priced per foot of fence per each wire. Materials only.	Feet	$0.07	500	$35.00
Gate, Pipe, 12 ft.	1057	6 rail tube gate, 16 gauge. Includes materials and shipping only.	Each	$179.02	1	$179.02
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53

Practice: 382 - Fence

Scenario: #3 - Woven Wire

Scenario Description:

Woven - Installation of fence will allow for implementation of a grazing management that allows for an adequate rest and recovery period, protection of sensitive area, improved water quality, reduction of noxious and invasive weeds. Woven wire is typically used in applications with sheep, goats, hogs, wildlife exclusion, shelterbelt/tree protection, etc. Constructed using fencing materials rather than a pre-manufactured gate.

Before Situation:

On grazing lands health and vigor are negatively impacted by poor grazing distribution, timing of grazing and inadequate rest and recovery periods. Water quality is impacted by increased erosion and runoff, livestock access to water bodies is uncontrolled. Reduced vegetative cover increases opportunity for encroachment of noxious and invasive weeds.

After Situation:

Installation of fence will allow for implementation of a rotational grazing plan that allows for an adequate rest and recovery period, protection of sensitive area, improved water quality, reduction of noxious and invasive weeds. Woven wire fence includes posts, wire, fasteners, gates, etc... Woven wire is typically used in applications with sheep, goats, hogs, wildlife exclusion, shelterbelt/tree protection, etc.

Feature Measure: Length of Fence

Scenario Unit: Feet

Scenario Typical Size: 1,320.0

Scenario Total Cost: $3,766.34

Scenario Cost/Unit: $2.85

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hours	$11.75	5	$58.75
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	5	$111.45
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$21.30	5	$106.50
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	45	$1,088.55
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	5	$132.30
Materials						
Wire, Barbed, Galvanized, 12.5 Gauge, 1,320' roll	1	Galvanized 12.5 gauge, 1,320' roll. Includes materials and shipping only.	Each	$71.04	2	$142.08
Wire, Woven, Galvanized, 12.5 Gauge, 32 in	3	Galvanized 12.5 gauge, 32 inch - 330 foot roll. Includes materials and shipping only.	Each	$154.37	4	$617.48
Post, Wood, CCA treated, 3-4 in. x 7 ft.	9	Wood Post, Line 3-4 inch dia. X 7 ft., CCA Treated. Includes materials and shipping only.	Each	$7.36	20	$147.20
Post, Wood, CCA treated, 6 in. x 8 ft.	12	Wood Post, End 6 inch dia. X 8 ft., CCA Treated. Includes materials and shipping only.	Each	$17.21	8	$137.68
Post, Steel T, 1.33 lbs, 6'	15	Steel Post, Studded 6' - 1.33 lb. Includes materials and shipping only.	Each	$5.60	90	$504.00
Fence, Wire Assembly, Barbed Wire	30	Brace pins, battens, clips, staples. Includes materials and shipping only.	Feet	$0.19	1320	$250.80
Fence, Wire Assembly, Woven Wire	35	Brace pins, twist sticks, staples. Includes materials and shipping only.	Feet	$0.10	1320	$132.00
Gate, Pipe, 12 ft.	1057	6 rail tube gate, 16 gauge. Includes materials and shipping only.	Each	$179.02	1	$179.02
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53

Practice: 382 - Fence

Scenario: #4 - Electric

Scenario Description:

Electric - Installation of fence will allow for implementation of a grazing management that allows for an adequate rest and recovery period, protection of sensitive area, improved water quality, reduction of noxious and invasive weeds.

Before Situation:

On grazinglands health and vigor are negatively impacted by poor grazing distribution, timing of grazing and inadequate rest and recovery periods. Water quality is impacted by increased erosion and runoff, cattle access to water bodies is uncontrolled. Reduced vegetative cover increases the opportunity for encroachment of noxious and invasive weeds.

After Situation:

Installation of fence will allow for implementation of grazing management that allows for an adequate rest and recovery period, protection of sensitive area, improved water quality, reduction of noxious and invasive weeds. Fence includes posts, wire, fasteners, gates, fence charger, etc... Two to three strand wire is commonly installed. Fence will be installed with wildlife friendly considerations.

Feature Measure: Length of Fence

Scenario Unit: Feet

Scenario Typical Size: 1,320.0

Scenario Total Cost: $2,372.45

Scenario Cost/Unit: $1.80

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hours	$11.75	3	$35.25
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	2	$44.58
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$21.30	3	$63.90
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	20	$483.80
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	3	$79.38
Materials						
Post, Wood, CCA treated, 3-4 in. x 7 ft.	9	Wood Post, Line 3-4 inch dia. X 7 ft., CCA Treated. Includes materials and shipping only.	Each	$7.36	2	$14.72
Post, Wood, CCA treated, 6 in. x 8 ft.	12	Wood Post, End 6 inch dia. X 8 ft., CCA Treated. Includes materials and shipping only.	Each	$17.21	8	$137.68
Post, Fiberglass, 7/8 in X 6 ft	18	Fiberglass line post, 7/8 inch diameter X 6 foot length. Includes materials and shipping only.	Each	$9.55	60	$573.00
Electric, Ground Rods	20	Electric, Ground Rod for electric fence. Includes materials and shipping only.	Each	$10.95	6	$65.70
Electric, Ground Rod Clamps	21	Electric, Ground Rod Clamps for electric fence. Includes materials and shipping only.	Each	$2.16	6	$12.96
Electric, Lightening Diverter	22	Electric, Lightening diverter for electric fence. Includes materials and shipping only.	Each	$8.65	1	$8.65
Electric, Insulated cable	23	Electric, Insulated cable for electric fence. Typically in spools of 100 to 200 feet. Includes materials and shipping only.	Each	$34.43	1	$34.43
Electric, Tester	26	Electric, Tester for electric fence. Includes materials and shipping only.	Each	$46.56	1	$46.56
Electric, Energizer, 6 joule	29	Electric, Energizer, 6 joule for electric fence. Includes materials and shipping only.	Each	$360.76	1	$360.76
Fence, Wire Assembly, High Tensile, Electric, 2 Strand	33	Brace pins, springs, strainers, battens, clips, crimp sleeves, staples, insulators, wrap around sleeves. Includes materials and shipping only.	Feet	$0.07	1320	$92.40
Gate, Pipe, 10 ft.	1056	6 rail tube gate, 16 gauge. Includes materials and shipping only.	Each	$160.15	1	$160.15
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53

Practice: 382 - Fence

Scenario: #5 - Wildlife Exclusion

Scenario Description:
Installation of fence (typically 8' high for big game species) reduces resource concerns associated with wildlife access to prevent conflicts between humans and wildlife species.

Before Situation:
Wildlife negatively impacting sensitive areas such as riparian areas, windbreaks and shelterbelts or feed storage. Disease transmission from wildlife posses a significant health risk to domestic animals.

After Situation:
Installation of fence reduces resource concerns associated with wildlife access and prevents conflicts between humans and threatened, endangered or sensitive species. 8' high Fence includes posts, wire, fasteners, gates, etc...

Feature Measure: Length of Fence

Scenario Unit: Feet

Scenario Typical Size: 1,320.0

Scenario Total Cost: $8,072.78

Scenario Cost/Unit: $6.12

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hours	$11.75	5	$58.75
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.59	8	$52.72
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	20	$445.80
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$21.30	20	$426.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	60	$1,451.40
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	5	$132.30
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	20	$906.80
Materials						
Wire, Woven, Wildlife, 96 in.	6	High Tensile 12.5 gauge, 96 inch - 330 foot roll. Includes materials and shipping only.	Each	$489.01	4	$1,956.04
Post, Wood, CCA treated, 6 in. x 8 ft.	12	Wood Post, End 6 inch dia. X 8 ft., CCA Treated. Includes materials and shipping only.	Each	$17.21	8	$137.68
Post, Wood, CCA treated, 6 in. x 12-14 ft.	13	Wood Post, Line/End 6 inch dia. X 12-14 ft., CCA Treated. Includes materials and shipping only.	Each	$28.91	20	$578.20
Post, Steel T, 1.33 lbs, 10 ft.	17	Steel Post, Studded 10 ft. - 1.33 lb. Includes materials and shipping only.	Each	$10.23	130	$1,329.90
Gate, Game, 8 ft. High X 16 ft. Wide	1086	16 ft. Wide Game Gate (8 ft. tall). Includes materials and shipping only.	Each	$438.66	1	$438.66
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53

Practice: 382 - Fence

Scenario: #6 - Safety

Scenario Description:

A barrier (fence) implemented on an NRCS constructed waste storage system according to engineering design to exclude human access. Permanently installed fence built to (1) keep humans away from waste ponds & lagoons, or (2) to protect sensitive areas (riparian areas, wetlands, springs, etc.) from heavy livestock pressure. Heavy grade fence materials and close post spacing required.

Before Situation:

Where a NRCS designed and constructed waste storage pond is planned whereby significant risk to human safety is determined to be evident. Livestock has access to sensitive areas that may cause detrimental effect to animal/human health and wilidlife habitat. Resouce concerns affected are plant health and vigor, wildlife habitat, compaction of soils, runoff of sediment or water quality due to turbidity..

After Situation:

Humans and livestock are excluded from the waste storage pond for safety purposes by installing a fence around a waste holding pond. The fence would typically be 100 wide x 175 long with one gate and installed by a fencing contractor. Woven wire fence with one strand of barb wire on top with a gate. Improved livestock control and access to water or other sensative areas will promote saftey for livestock/humans improve health, vigor of sensitive species, limiting soil erosion, and condition.Associated practices may include 614-Watering Facility, 516-Pipeline, 533-Pumping Plant, 342 - Critical Area Planting

Feature Measure: Length of Fence

Scenario Unit: Feet

Scenario Typical Size: 450.0

Scenario Total Cost: $2,194.07

Scenario Cost/Unit: $4.88

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hours	$11.75	12	$141.00
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	12	$267.48
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$21.30	12	$255.60
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	12	$290.28
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	12	$317.52
Materials						
Wire, Barbed, Galvanized, 12.5 Gauge, 1,320' roll	1	Galvanized 12.5 gauge, 1,320' roll. Includes materials and shipping only.	Each	$71.04	1	$71.04
Wire, Woven, Galvanized, 12.5 Gauge, 32 in	3	Galvanized 12.5 gauge, 32 inch - 330 foot roll. Includes materials and shipping only.	Each	$154.37	1	$154.37
Post, Wood, CCA treated, 3-4 in. x 7 ft.	9	Wood Post, Line 3-4 inch dia. X 7 ft., CCA Treated. Includes materials and shipping only.	Each	$7.36	8	$58.88
Post, Wood, CCA treated, 6 in. x 8 ft.	12	Wood Post, End 6 inch dia. X 8 ft., CCA Treated. Includes materials and shipping only.	Each	$17.21	4	$68.84
Post, Steel T, 1.33 lbs, 6'	15	Steel Post, Studded 6' - 1.33 lb. Includes materials and shipping only.	Each	$5.60	45	$252.00
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	2	$317.06

Practice: 382 - Fence

Scenario: #7 - Temporary

Scenario Description:

Electric - Installation of temporary 1-2 wire fence to allow for implementation of grazing management that allows for an adequate rest and recovery period, protection of sensitive area, improved water quality, reduction of noxious and invasive weeds. Fence is only present when livestock are present, may be removed when grazing period is finished.

Before Situation:

On grazinglands health and vigor are negatively impacted by poor grazing distribution, timing of grazing and inadequate rest and recovery periods. Water quality is impacted by increased erosion and runoff, cattle access to water bodies is uncontrolled. Reduced vegetative cover increases the opportunity for encroachment of noxious and invasive weeds. Existing fence on pasture boundaries will be utilized to tie in with the temporary elctric fence.

After Situation:

Installation of fence will allow for implementation of grazing management that allows for an adequate rest and recovery period, protection of sensitive area, improved water quality, reduction of noxious and invasive weeds. Fence includes posts, wire, fasteners, gates, fence charger, etc... Single strand wire is commonly installed. Fence will be installed with wildlife friendly considerations. Associated practices may include 614-Watering Facility, 516-Pipeline, 533-Pumping Plant.

Feature Measure: length of fence

Scenario Unit: Feet

Scenario Typical Size: 1,320.0

Scenario Total Cost: $802.02

Scenario Cost/Unit: $0.61

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Materials						
Wire, Polywire	8	Wire, Polywire for electric fence - 1,300 ft. Includes materials and shipping only.	Each	$51.47	1	$51.47
Post, Fiberglass, 7/8 in X 6 ft	18	Fiberglass line post, 7/8 inch diameter X 6 foot length. Includes materials and shipping only.	Each	$9.55	44	$420.20
Electric, Energizer, Solar	27	Electric, Energizer, Solar for electric fence. Includes materials and shipping only.	Each	$330.35	1	$330.35

Practice: 382 - Fence

Scenario: #51 - Pole Fence

Scenario Description:

A pole type fence, such as buck and pole, 3 rail, worm fence, or corral fence. Typically used in situations for wildlife accommodation in protecting small areas such as springs, building fences in high snow load areas, livestock working facilities, or CAFO relocation.

Before Situation:

An area of special concern such as a spring receives damage from livestock concentration, or grazing management requires improvement in a high snow load area, or lack of necessary livestock working facilities constrains the implementation of prescribed grazing, or a CAFO near a surface water source require relocation. Resources concerns can include water quality, plant community health, and wildlife habitat.

After Situation:

Fence installation alleviates the resource problem caused by livestock concentration or grazing management resulting in improved water quality, wildlife habitat, and plant community health.

Feature Measure: linear feet of fence

Scenario Unit: Feet

Scenario Typical Size: 300.0

Scenario Total Cost: $3,109.32

Scenario Cost/Unit: $10.36

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hours	$11.75	10	$117.50
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	10	$222.90
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$21.30	10	$213.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	30	$725.70
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	10	$264.60
Materials						
Post, Wood, CCA treated, 4 in x 8 ft	10	Wood Post, Line 4 inch X 8 foot, CCA Treated. Includes materials and shipping only.	Each	$9.67	90	$870.30
Post, Wood, CCA treated, 6 in. x 8 ft.	12	Wood Post, End 6 inch dia. X 8 ft., CCA Treated. Includes materials and shipping only.	Each	$17.21	30	$516.30
Gate, Pipe, 12 ft.	1057	6 rail tube gate, 16 gauge. Includes materials and shipping only.	Each	$179.02	1	$179.02

Practice: 382 - Fence

Scenario: #52 - Multi Strand Barbed or Smooth Wire Very Difficult terrain

Scenario Description:

Barbed, Smooth ,or Woven Wire Very Difficult Installation - Installation of fence in very difficult situations such as very shallow soils, extreme slopes or extensive clearing of trees that will allow for implementation of grazing management that allows for an adequate rest and recovery period, protection of sensitive area, improved water quality, reduction of noxious and invasive weeds.

Before Situation:

On grazing lands health and vigor are negatively impacted by poor grazing distribution, timing of grazing and inadequate rest and recovery periods. Water quality is impacted by increased erosion and runoff, cattle access to water bodies is uncontrolled. Reduced vegetative cover increases the opportunity for encroachment of noxious and invasive weeds. Fence installation conditions are for very difficult sites such as extreme slopes, very shallow to bedrock soils, dense trees, etc.

After Situation:

Installation of fence will allow for implementation of grazing management that allows for an adequate rest and recovery period, protection of sensitive area, improved water quality, reduction of noxious and invasive weeds. Fence includes posts, wire, fasteners, gates, brace posts, etc... Fence will be installed with wildlife friendly considerations.

Feature Measure: foot

Scenario Unit: Feet

Scenario Typical Size: 1,320.0

Scenario Total Cost: $4,834.64

Scenario Cost/Unit: $3.66

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$29.47	10	$294.70
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hours	$11.75	10	$117.50
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.59	1	$6.59
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	32	$713.28
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$21.30	10	$213.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	60	$1,451.40
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	10	$264.60
Materials						
Wire, Barbed, Galvanized, 12.5 Gauge, 1,320' roll	1	Galvanized 12.5 gauge, 1,320' roll. Includes materials and shipping only.	Each	$71.04	4	$284.16
Post, Wood, CCA treated, 3-4 in. x 7 ft.	9	Wood Post, Line 3-4 inch dia. X 7 ft., CCA Treated. Includes materials and shipping only.	Each	$7.36	20	$147.20
Post, Wood, CCA treated, 6 in. x 8 ft.	12	Wood Post, End 6 inch dia. X 8 ft., CCA Treated. Includes materials and shipping only.	Each	$17.21	8	$137.68
Post, Steel T, 1.33 lbs, 6'	15	Steel Post, Studded 6' - 1.33 lb. Includes materials and shipping only.	Each	$5.60	90	$504.00
Fence, Wire Assembly, Barbed Wire	30	Brace pins, battens, clips, staples. Includes materials and shipping only.	Feet	$0.19	1320	$250.80
Vinyl Undersill Strips	241	Marking material using the undersill strips of vinyl siding. Priced per foot of fence per each wire. Materials only.	Feet	$0.07	500	$35.00
Gate, Pipe, 12 ft.	1057	6 rail tube gate, 16 gauge. Includes materials and shipping only.	Each	$179.02	1	$179.02
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 382 - Fence

Scenario: #60 - Confinement

Scenario Description:
Installation of fence reduces resource concerns associated with livestock feeding operations and/or wildlife access to prevent conflicts between humans and livestock or wildlife species.

Before Situation:
Wildlife negatively impacting sensitive areas such as riparian areas, windbreaks and shelterbelts or feed storage. Disease transmission from wildlife posses a significant health risk to domestic animals.

After Situation:
Installation of fence reduces resource concerns associated with livestock and/or wildlife access and prevents conflicts between humans and threatened, endangered or sensitive species. Fence includes posts, wire, fasteners, gates, etc...

Feature Measure: Length of Fence

Scenario Unit: Feet

Scenario Typical Size: 1,320.0

Scenario Total Cost: $6,027.92

Scenario Cost/Unit: $4.57

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hours	$11.75	5	$58.75
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	4	$89.16
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$21.30	5	$106.50
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	60	$1,451.40
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	5	$132.30
Materials						
Wire, Woven, Wildlife, 96 in.	6	High Tensile 12.5 gauge, 96 inch - 330 foot roll. Includes materials and shipping only.	Each	$489.01	4	$1,956.04
Post, Wood, CCA treated, 6 in. x 8 ft.	12	Wood Post, End 6 inch dia. X 8 ft., CCA Treated. Includes materials and shipping only.	Each	$17.21	8	$137.68
Post, Wood, CCA treated, 6 in. x 12-14 ft.	13	Wood Post, Line/End 6 inch dia. X 12-14 ft., CCA Treated. Includes materials and shipping only.	Each	$28.91	20	$578.20
Post, Steel T, 1.33 lbs, 10 ft.	17	Steel Post, Studded 10 ft. - 1.33 lb. Includes materials and shipping only.	Each	$10.23	90	$920.70
Gate, Game, 8 ft. High X 16 ft. Wide	1086	16 ft. Wide Game Gate (8 ft. tall). Includes materials and shipping only.	Each	$438.66	1	$438.66
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53

Practice: 383 - Fuel Break

Scenario: #1 - Sprouting Species - Mechanical

Scenario Description:

Fuel Break installation requires tree thinning, treating woody residue, and/or mowing on sprouting species such as Gambel oak. Thinning treatment is done with equipment, treating woody residue (piling/burning, crushing, or off-site removal) and mowing are mechanized. Resource concerns are degraded plant condition - wildfire hazard, excess biomass accumulation & undesirable productivity and health.

Before Situation:

Forest stand is overstocked with desirable and undesirable trees and/or shrubs. Overstocking creates conditions conducive to wildfire movement across the landscape, and severe loss/damage of the forest stand. Shrub levels are high and significanly increase wildfire risk. Tree crowns are touching, trees retain limbs down to understory vegetation creating a "ladder" for fire movement into the overstory, and understory vegetation (brush and grasses) create a significant fuel load to rate a high to severe fire hazard. The terrain is moderately to steeply sloped (1-30%), increasing difficulty as slope steepens.

After Situation:

Fuel Break is installed at the property line or a key locations to reduce crown fire spread. Size of fuel break is 4 acres; the width varies due to site conditions. The trees are thinned so open gaps are created in crown overstory, branches on remaining trees are pruned to 8 to 10 feet in height, all woody residue (thinned trees and pruned branches) are treated (piled/burned or lopped/scattered) so little remains in the fuel break and understory vegetation is mowed down to less than 1 foot in height. Cut stumps have been chemically treated to control sprouting.

Feature Measure: Area of Treatment

Scenario Unit: Acres

Scenario Typical Size: 4.0

Scenario Total Cost: $3,764.19

Scenario Cost/Unit: $941.05

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$96.65	10	$966.50
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	2	$44.58
Mechanical cutter, chopper	943	Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included.	Hours	$90.63	8	$725.04
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hours	$66.08	4	$264.32
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$19.49	3	$58.47
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	8	$211.68
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	10	$336.40
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	12	$544.08
Materials						
Tree Marking Paint	313	Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only.	Acres	$8.78	4	$35.12
Herbicide, Triclopyor	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acres	$27.92	3	$83.76
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	100	$100.00
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 383 - Fuel Break

Scenario: #2 - Nonsprouting Species - Mechanical

Scenario Description:

Fuel Break installation requires tree thinning, treating woody residue, pruning, and/or masticating on nonsprouting species such as pinon and juniper or mixed conifer stands. Thinning treatment is done with equipment or with chainsaws, any pruning is done by hand, treating woody residue (piling/burning, crushing, or off-site removal) and masticating are mechanized. Resource concerns are degraded plant condition - wildfire hazard, excess biomass accumulation & undesirable productivity and health.

Before Situation:

Forest stand is overstocked with desirable and undesirable trees and/or shrubs. Overstocking creates conditions conducive to wildfire movement across the landscape, and severe loss/damage of the forest stand. Shrub and/or tree levels are high and significanly increase wildfire risk. Tree crowns are touching, trees retain limbs down to understory vegetation creating a "ladder" for fire movement into the overstory, and understory vegetation (brush and grasses) create a significant fuel load to rate a high to severe fire hazard. The terrain is moderately to steeply sloped (1-30%), increasing difficulty as slope steepens.

After Situation:

Fuel Break is installed at the property line or a key locations to reduce crown fire spread. Size of fuel break is 4 acres; the width varies due to site conditions. The trees are thinned so open gaps are created in crown overstory, branches on remaining trees are pruned to 4 to 5 feet in height, all woody residue (thinned trees and pruned branches) are treated (piled/burned or lopped/scattered) so little remains in the fuel break and understory vegetation is mmasticated down to less than 1 foot in height.

Feature Measure: Area of Treatment

Scenario Unit: Acres

Scenario Typical Size: 4.0

Scenario Total Cost: $5,693.50

Scenario Cost/Unit: $1,423.38

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$96.65	7	$676.55
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.59	100	$659.00
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	2	$44.58
Mechanical cutter, chopper	943	Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included.	Hours	$90.63	5	$453.15
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	100	$2,419.00
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	5	$132.30
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	7	$235.48
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	12	$544.08
Materials						
Tree Marking Paint	313	Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only.	Acres	$8.78	4	$35.12
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	100	$100.00
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 383 - Fuel Break

Scenario: #3 - Hand Fuel Break

Scenario Description:

Fuel Break installation requires tree thinning, treating woody residue, and/or pruning. Thinning treatment, pruning, brush cutting and treating woody residue (piling/burning, chipping and/or off-site removal), is done by hand. Resource concerns are degraded plant condition - wildfire hazard, excess biomass accumulation & undesirable productivity and health.

Before Situation:

Forest stand is overstocked with desirable and undesirable trees and/or brush. Overstocking creates conditions conducive to wildfire movement across the landscape, and loss of the forest stand. Excess stocking is impacting the health of the desired forest ecosystem and wildfire hazard poses risk to humans, structures, air quality, plants and animals. Tree crowns are touching, trees retain limbs down to understory vegetation creating a "ladder" for fire movement into the overstory, and understory vegetation (brush and grasses) create a significant fuel load.

After Situation:

A fuel break is installed by hand cutting trees, hand pruning remaining trees, piling and burning, chipping or removal of woody residue from tree cutting and pruning. FB installation is at property lines, around structures, at roadways, or other key locations to reduce continuity of vegetation cover. Width of fuel break varies based on site conditions.

Feature Measure: Area of Treatment

Scenario Unit: Acres

Scenario Typical Size: 4.0

Scenario Total Cost: $6,376.78

Scenario Cost/Unit: $1,594.20

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.59	40	$263.60
Brush Chipper, 6 in. capacity	938	Brush Chipper, 6 inch capacity, typically 35 HP. Includes chipper and power unit. Labor not included.	Hours	$28.03	80	$2,242.40
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	12	$267.48
Pruning tools, hand tools	1318	Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included.	Hours	$2.13	10	$21.30
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	120	$2,902.80
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	12	$544.08
Materials						
Tree Marking Paint	313	Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only.	Acres	$8.78	4	$35.12
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	100	$100.00

Practice: 383 - Fuel Break

Scenario: #4 - Non Forest Fuel Break

Scenario Description:

A non forest fuel break occurs outside of forestlands where brush, grass and forbs dominate. Landuses where this scenario will be applied may be range, pasture or wetlands. The fuel break area is mowed/bushhog so standing vegetation is reduced to a low height. Resource concerns are degraded plant condition - wildfire hazard.

Before Situation:

Wildfire movement is a concern within the designated area. Vegetation is tall, dense and continuous creating conditions conducive for fire movement across the landscape.

After Situation:

A fuel break is installed by shredding/mowing/bushhogging a defined width at property lines, around structures, at roadways, or other key locations to reduce continuity of vegetation cover. Width of fuel break varies based on site conditions.

Feature Measure: Area of Treatment

Scenario Unit: Acres

Scenario Typical Size: 4.0

Scenario Total Cost: $588.67

Scenario Cost/Unit: $147.17

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	2	$44.58
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hours	$46.50	4	$186.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	2	$48.38
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	4	$105.84
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	1	$45.34
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53

Practice: 383 - Fuel Break

Scenario: #20 - PJ Mechanical Removal - Low Density

Scenario Description:

Removal of pinyon/juniper trees in areas with low density of less than 100 trees per acre. The practice entails the removal of trees by mechanical means, either chainsaw or heavy equipment or a combination as appropriate in order to reduce fuel loading and improve ecological site condition.

Before Situation:

Area consists of stands of pinyon and juniper causing excessive fuel loads, degrading health and vigor of native herbaceous species, promoting noxious and invasive species, and degrading wildlife habitat, especially for sage grouse areas.

After Situation:

Pinyon and Juniper trees are removed to reduce fuel loads and achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and improved wildlife habitat.

Feature Measure: acre

Scenario Unit: Acres

Scenario Typical Size: 500.0

Scenario Total Cost: $66,037.71

Scenario Cost/Unit: $132.08

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Mechanical cutter, chopper	943	Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included.	Hours	$90.63	500	$45,315.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	300	$7,257.00
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	500	$13,230.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 383 - Fuel Break

Scenario: #21 - PJ Mechanical Removal - Moderate Density

Scenario Description:

Removal of pinyon/juniper trees in areas with moderate density between 101 - 250 trees per acre. The practice entails the removal of trees by mechanical means, either chainsaw or heavy equipment or a combination as appropriate in order to reduce fuel loading and improve ecological site condition.

Before Situation:

Area consists of stands of pinyon and juniper causing excessive fuel loads, degrading health and vigor of native herbaceous species promoting noxious and invasive species and degrading wildlife habitat, especially for sage grouse areas.

After Situation:

Pinyon and Juniper trees are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, reduced fuel loads, hydrology and plant health and vigor is returning to near normal levels, and improved wildlife habitat.

Feature Measure: acre

Scenario Unit: Acres

Scenario Typical Size: 500.0

Scenario Total Cost: $103,583.71

Scenario Cost/Unit: $207.17

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Mechanical cutter, chopper	943	Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included.	Hours	$90.63	800	$72,504.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	400	$9,676.00
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	800	$21,168.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 383 - Fuel Break

Scenario: #22 - PJ Mechanical Removal - High Density

Scenario Description:

Removal of pinyon and juniper trees in areas with high density of over 251 trees per acre. The practice entails the removal of fuels by mechanical means, either chainsaw or heavy equipment or a combination as appropriate in order to reduce fuel loading and improve ecological site condition.

Before Situation:

Area consists of excessive stands of pinyon and juniper causing excessive fuels loads, degrading health and vigor of native herbaceous species promoting noxious and invasive species and degrading wildlife habitat, especially for sage grouse areas.

After Situation:

Pinyon and Juniper trees are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, fuel loads are reduced, hydrology and plant health and vigor is returning to near normal levels, and improved wildlife habitat.

Feature Measure: acre

Scenario Unit: Acres

Scenario Typical Size: 500.0

Scenario Total Cost: $164,547.71

Scenario Cost/Unit: $329.10

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Mechanical cutter, chopper	943	Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included.	Hours	$90.63	1300	$117,819.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	500	$12,095.00
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	1300	$34,398.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 383 - Fuel Break

Scenario: #23 - Lop and Scatter, light

Scenario Description:

Treating an area of pinyon and juniper to reduce hazardous fuels and the risk of insect and disease, improve organic matter and reduce erosion while improving water quality. Typically done by hand and light equipment. Resource concerns include: Wildfire hazard from excessive biomass accumulation and potential Excessive plant pest pressure.

Before Situation:

A pinyon and juniper stand is causing both fire hazard and pest issues. Up to 100 trees per acre needing treatment, or majority of small (less than 4 inches) material.

After Situation:

Fire and pest issues are reduced with slash spread out and in contact with the ground. Additional benefits include reduced soil movement. The soil is protected and/or enhanced.

Feature Measure: acre

Scenario Unit: Acres

Scenario Typical Size: 40.0

Scenario Total Cost: $2,751.12

Scenario Cost/Unit: $68.78

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.59	72	$474.48
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	24	$534.96
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	72	$1,741.68

Practice: 383 - Fuel Break

Scenario: #24 - Lop and Scatter, medium

Scenario Description:

Treating an area of pinyon and juniper to reduce hazardous fuels and the risk of insect and disease, improve organic matter and reduce erosion while improving water quality. Typically done by hand and light equipment. Resource concerns include: Wildfire hazard from excessive biomass accumulation and potential Excessive plant pest pressure.

Before Situation:

Pinyon and juniper is causing both fire hazard and pest issues. Up to 100-300 trees per acre needing treatment, or majority of 5-7 inch material.

After Situation:

Fire and pest issues are reduced with slash spread out and in contact with the ground. Additional benefits include reduced soil movement. The soil is protected and/or enhanced.

Feature Measure: acre

Scenario Unit: Acres

Scenario Typical Size: 40.0

Scenario Total Cost: $4,942.89

Scenario Cost/Unit: $123.57

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.59	128	$843.52
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	45	$1,003.05
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	128	$3,096.32

Practice: 383 - Fuel Break

Scenario: #25 - Lop and Scatter, heavy

Scenario Description:

Treating an area of pinyon and juniper to reduce hazardous fuels and the risk of insect and disease, improve organic matter and reduce erosion while improving water quality. Typically done by hand and light equipment. Resource concerns include: Wildfire hazard from excessive biomass accumulation and potential Excessive plant pest pressure.

Before Situation:

Pinyon and juniper is causing both fire hazard and pest issues. Greater than 300 trees and/or slash per acre needing treatment, or majority of greater than 8 inch material.

After Situation:

Fire and pest issues are reduced with slash spread out and in contact with the ground. Additional benefits include reduced soil movement. The soil is protected and/or enhanced.

Feature Measure: acre

Scenario Unit: Acres

Scenario Typical Size: 40.0

Scenario Total Cost: $7,582.56

Scenario Cost/Unit: $189.56

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.59	200	$1,318.00
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	64	$1,426.56
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	200	$4,838.00

Practice: 383 - Fuel Break

Scenario: #26 - Fuel Break

Scenario Description:

Fuel Break installation requires tree thinning, treating woody residue, pruning, and mowing. Thinning treatment and pruning is done by hand, treating woody residue (piling/burning, crushing, or off-site removal) and mowing are mechanized. Resource concerns are degraded plant condition - wildfire hazard, excess biomass accumulation & undesirable productivity and health.

Before Situation:

Forest stand is overstocked with desirable and undesirable trees. Overstocking creates conditions conducive to wildfire movement across the landscape, and severe loss/damage of the forest stand. Shrub levels are high and significanly increase wildfire risk. Tree crowns are touching, trees retain limbs down to understory vegetation creating a "ladder" for fire movement into the overstory, and understory vegetation (brush and grasses) create a significant fuel load to rate a high to severe fire hazard. The terrain is moderately to steeply sloped (1-30%), increasing difficulty as slope steepens.

After Situation:

Fuel Break is installed at the property line or a key locations to reduce crown fire spread. Size of fuel break is 4 acres; the width varies due to site conditions. The trees are thinned so open gaps are created in crown overstory, branches on remaining trees are pruned to 8 to 10 feet in height, all woody residue (thinned trees and pruned branches) are treated (piled/burned or lopped/scattered) so little remains in the fuel break and understory vegetation is mowed down to less than 1 foot in height. Cut stumps have been chemically treated to control sprouting.

Feature Measure: Area of Treatment

Scenario Unit: Acres

Scenario Typical Size: 4.0

Scenario Total Cost: $6,227.14

Scenario Cost/Unit: $1,556.79

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$96.65	10	$966.50
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.59	80	$527.20
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	8	$178.32
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hours	$46.50	8	$372.00
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hours	$66.08	8	$528.64
Pruning tools, hand tools	1318	Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included.	Hours	$2.13	8	$17.04
Pruning tool, pole saw	1319	Gasoline powered pole chainsaw. Labor not included.	Hours	$8.63	8	$69.04
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	80	$1,935.20
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	8	$211.68
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	10	$336.40
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	12	$544.08
Materials						
Tree Marking Paint	313	Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only.	Acres	$8.78	4	$35.12
Herbicide, Triclopyor	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acres	$27.92	4	$111.68
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 383 - Fuel Break

Scenario: #27 - Fuel Break-steep slopes

Scenario Description:

Fuel Break installation requires tree thinning, treating woody residue, pruning, and brush cutting. Thinning treatment, tree pruning and brush cutting are done by hand, treating woody residue (piling/burning, crushing, or off-site removal) is mechanized and hand treatment. Resource concerns are degraded plant condition - wildfire hazard, excess biomass accumulation & undesirable productivity and health.

Before Situation:

The forest stand is overstocked with trees (desirable and undesirable) and is at risk of loss if a wildfire should occur. Tree crowns are touching, trees retain limbs down to understory vegetation creating a "ladder" for fire movement into the overstory, and understory vegetation (brush and grasses) create a significant fuel load to rate a high to severe fire hazard. A fuel break is implemented to reduce the risk of a crown spreading wildfire. The terrain is steep, 40+%, which significantly reduces efficiency and increases cost of installation. More cutting of trees & brush and treatment of woody residue is accomplished using labor due to very steep slopes.

After Situation:

Fuel Break is installed at the property line or key locations to reduce crown fire spread. Size of fuel break is 4 acres; the width varies due to site conditions. The trees are thinned so open gaps are created in crown overstory; branches on remaining trees are pruned to a minimum of 8 to 10 feet in height; all woody residue, thinned trees, pruned branches and cut brush, are treated.

Feature Measure: Area of Treatment

Scenario Unit: Acres

Scenario Typical Size: 4.0

Scenario Total Cost: $10,093.32

Scenario Cost/Unit: $2,523.33

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$96.65	10	$966.50
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.59	160	$1,054.40
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	10	$222.90
Mechanical cutter, chopper	943	Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included.	Hours	$90.63	10	$906.30
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hours	$66.08	14	$925.12
Pruning tools, hand tools	1318	Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included.	Hours	$2.13	14	$29.82
Pruning tool, pole saw	1319	Gasoline powered pole chainsaw. Labor not included.	Hours	$8.63	8	$69.04
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	160	$3,870.40
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	10	$264.60
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	10	$336.40
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	20	$906.80
Materials						
Tree Marking Paint	313	Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only.	Acres	$8.78	4	$35.12
Herbicide, Triclopyor	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acres	$27.92	4	$111.68
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 383 - Fuel Break

Scenario: #28 - Fuel Break- Masticator

Scenario Description:

Fuel Break installation requires tree thinning, treating woody residue, pruning, and mowing. Thinning treatment and pruning is done by hand; treating woody residue (piling/burning, crushing, or off-site removal) and mowing are mostly mechanized. Resource concerns are degraded plant condition - wildfire hazard, excess biomass accumulation & undesirable productivity and health.

Before Situation:

The forest stand is overstocked with trees (desirable and undesirable) and is at risk of loss if a wildfire should occur. Tree crowns are touching, trees retain limbs down to understory vegetation creating a "ladder" for fire movement into the overstory, and understory vegetation (brush and grasses) create a significant fuel load to rate a high to severe fire hazard. Slope of terrain increases fire hazard. The terrain moderately sloped, 1-30+% increasing difficulty as slope steepens.

After Situation:

Fuel Break is installed at the property line or key locations to reduce crown fire spread. Size of fuel break is 4 acres; the width varies due to site conditions. The trees are thinned so open gaps are created in crown overstory, branches on remaining trees are pruned to 8 to 10 feet in height, all woody residue (thinned trees, pruned branches and brush) are mostly masticated but some is piled/burned, hauled of site or lopped/scattered) understory vegetation is cut down to less than 1 foot in height. Cut stumps have been chemically treated to control sprouting.

Feature Measure: Area of Treatment

Scenario Unit: Acres

Scenario Typical Size: 4.0

Scenario Total Cost: $6,023.64

Scenario Cost/Unit: $1,505.91

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.59	60	$395.40
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	8	$178.32
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hours	$46.50	5	$232.50
Mechanical cutter, chopper	943	Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included.	Hours	$90.63	16	$1,450.08
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hours	$66.08	8	$528.64
Pruning tools, hand tools	1318	Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included.	Hours	$2.13	8	$17.04
Pruning tool, pole saw	1319	Gasoline powered pole chainsaw. Labor not included.	Hours	$8.63	8	$69.04
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	80	$1,935.20
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	5	$132.30
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	12	$544.08
Materials						
Tree Marking Paint	313	Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only.	Acres	$8.78	4	$35.12
Herbicide, Triclopyor	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acres	$27.92	4	$111.68
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 383 - Fuel Break

Scenario: #29 - Fuel Break-Masticator, steep slopes

Scenario Description:

Fuel Break installation requires tree thinning, treating woody residue, pruning, and brush cutting. Thinning is mechanized and hand cutting, tree pruning and brush cutting are done by hand, treating woody residue (piling/burning, crushing, or off-site removal) is mechanized and some hand treatment. Resource concerns are degraded plant condition - wildfire hazard, excess biomass accumulation & undesirable productivity and health.

Before Situation:

The forest stand is overstocked with trees (desirable and undesirable) and is at risk of loss if a wildfire should occur. Tree crowns are touching, trees retain limbs down to understory vegetation creating a "ladder" for fire movement into the overstory, and understory vegetation (brush and grasses) create a significant fuel load to rate a high to severe fire hazard. Slope of terrain significantly increases fire hazard rating due to preheating effect. The terrain is steeply sloped, 40+%, which significantly reduces implementation efficiency. More hand cutting and treatment of woody residue is accomplished using labor due to very steep slopes.

After Situation:

Fuel Break is installed a the property line or a key locations to reduce crown fire spread. Size of fuel break is 4 acres; the width varies due to site conditions. The trees are thinned so open gaps are created in crown overstory, branches on remaining trees are pruned to 8 to 10 feet in height, all woody residue (thinned trees, pruned branches and brush) are mostly masticated but some is piled/burned, hauled of site or lopped/scattered) so little remains in the fuel break and understory vegetation is cut down to less than 1 foot in height. Cut stumps have been chemically treated to control sprouting.

Feature Measure: Area of Treatment

Scenario Unit: Acres

Scenario Typical Size: 4.0

Scenario Total Cost: $8,732.31

Scenario Cost/Unit: $2,183.08

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.59	120	$790.80
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	12	$267.48
Mechanical cutter, chopper	943	Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included.	Hours	$90.63	20	$1,812.60
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hours	$66.08	12	$792.96
Pruning tools, hand tools	1318	Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included.	Hours	$2.13	14	$29.82
Pruning tool, pole saw	1319	Gasoline powered pole chainsaw. Labor not included.	Hours	$8.63	7	$60.41
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	120	$2,902.80
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	12	$317.52
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	20	$672.80
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	12	$544.08
Materials						
Tree Marking Paint	313	Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only.	Acres	$8.78	4	$35.12
Herbicide, Triclopyor	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acres	$27.92	4	$111.68
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 384 - Woody Residue Treatment

Scenario: #1 - Lop and Scatter, light

Scenario Description:

Treating an area of forest slash or following a juniper chaining to reduce hazardous fuels and the risk of insect and disease, improve organic matter and reduce erosion while improving water quality. Typically done by hand and light equipment. Resource concerns include: Wildfire hazard from excessive biomass accumulation and potential Excessive plant pest pressure.

Before Situation:

Woody material resulting from a silvicultural practice such as pruning or a light thinning operation is causing both fire hazard and pest issues. Up to 100 trees and/or slash per acre needing treatment, or majority of small (less than 3 inches) material.

After Situation:

Fire and pest issues are reduced with slash spread out and in contact with the ground. Additional benefits include reduced soil movement. The soil is protected and/or enhanced.

Feature Measure: Acres treated

Scenario Unit: Acres

Scenario Typical Size: 40.0

Scenario Total Cost: $2,394.48

Scenario Cost/Unit: $59.86

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.59	72	$474.48
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	8	$178.32
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	72	$1,741.68

Practice: 384 - Woody Residue Treatment

Scenario: #2 - Lop and Scatter, medium

Scenario Description:

Treating an area of forest slash or following a juniper chaining to reduce hazardous fuels and the risk of insect and disease, improve organic matter and reduce erosion while improving water quality. Typically done by hand and light equipment. Resource concerns include: Wildfire hazard from excessive biomass accumulation and potential Excessive plant pest pressure.

Before Situation:

Woody material resulting from a silvicultural practice such as pruning or a light thinning operation is causing both fire hazard and pest issues. Up to 100-300 trees and/or slash per acre needing treatment, or majority of 3-6 inch material.

After Situation:

Fire and pest issues are reduced with slash spread out and in contact with the ground. Additional benefits include reduced soil movement. The soil is protected and/or enhanced.

Feature Measure: Acres treated

Scenario Unit: Acres

Scenario Typical Size: 40.0

Scenario Total Cost: $4,118.16

Scenario Cost/Unit: $102.95

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.59	128	$843.52
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	8	$178.32
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	128	$3,096.32

Practice: 384 - Woody Residue Treatment

Scenario: #3 - Lop and Scatter, heavy

Scenario Description:

Treating an area of forest slash or following a juniper chaining to reduce hazardous fuels and the risk of insect and disease, improve organic matter and reduce erosion while improving water quality. Typically done by hand and light equipment. Resource concerns include: Wildfire hazard from excessive biomass accumulation and potential Excessive plant pest pressure.

Before Situation:

Woody material resulting from a silvicultural practice such as pruning or a light thinning operation is causing both fire hazard and pest issues. Greater than 300 trees and/or slash per acre needing treatment, or majority of greater than 6 inch material.

After Situation:

Fire and pest issues are reduced with slash spread out and in contact with the ground. Additional benefits include reduced soil movement. The soil is protected and/or enhanced.

Feature Measure: Acres treated

Scenario Unit: Acres

Scenario Typical Size: 40.0

Scenario Total Cost: $6,334.32

Scenario Cost/Unit: $158.36

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.59	200	$1,318.00
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	8	$178.32
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	200	$4,838.00

Practice: 384 - Woody Residue Treatment

Scenario: #4 - Piling and Burning

Scenario Description:

Reducing woody waste created during forestry, agroforestry and horticultural activities by gathering, piling, and burning (under appropriate weather conditions) to remove piles to achieve management objectives. Does not include transport from property to a commercial facility. Resource concerns include reducing potential Excessive plant pest pressure, and Wildfire hazard from excessive biomass accumulation .

Before Situation:

Woody residue causes management issues including resource access, fire hazard and sites for harboring pests.

After Situation:

Fire and pest issues are reduced.

Feature Measure: Acres treated

Scenario Unit: Acres

Scenario Typical Size: 20.0

Scenario Total Cost: $3,113.52

Scenario Cost/Unit: $155.68

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.59	40	$263.60
Log skidder	942	Equipment and power unit costs. Labor not included.	Hours	$114.63	10	$1,146.30
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	40	$967.60
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	10	$264.60
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 384 - Woody Residue Treatment

Scenario: #5 - Chipping and hauling off-site

Scenario Description:

Reducing woody waste created during forestry, agroforestry and horticultural activities by gathering, chipping, and hauling off site to achieve management objectives. Does not include transport from property to a commercial facility. Resource concerns include potential Emissions of particulate matter, potential Excessive plant pest pressure, and Wildfire hazard from excessive biomass accumulation .

Before Situation:

Woody residue causes management issues including resource access, fire hazard and sites for harboring pests.

After Situation:

Fire and pest issues are reduced. Air and energy resources are conserved.

Feature Measure: Acres treated

Scenario Unit: Acres

Scenario Typical Size: 20.0

Scenario Total Cost: $5,090.21

Scenario Cost/Unit: $254.51

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.59	10	$65.90
Brush Chipper, 6 in. capacity	938	Brush Chipper, 6 inch capacity, typically 35 HP. Includes chipper and power unit. Labor not included.	Hours	$28.03	30	$840.90
Log skidder	942	Equipment and power unit costs. Labor not included.	Hours	$114.63	10	$1,146.30
Truck, dump, 8 CY	1401	Dump truck for moving bulk material. Typically capacity is 12 ton or 8 cubic yards. Includes equipment only.	Hours	$54.27	20	$1,085.40
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	60	$1,451.40
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	10	$264.60
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 384 - Woody Residue Treatment

Scenario: #6 - Forest Slash Treatment - Heavy

Scenario Description:

Treating an area of significant woody plant residues to reduce hazardous fuels and the risk of insect and disease, improve organic matter, decrease unwanted habitat, and reduce erosion while improving water quality. Slash is to be lopped/treated/crushed within a foot of the ground or moved off site to meet state fire hazard reduction standards. Typically heavy equipment are used such as masticators, mulchers, drum choppers, etc. Hand work with chainsaws are used on steep slopes. Resource concerns include potential Emission of particulate matter, Wildfire hazard from excessive biomass accumulation, Excessive plant pest pressure, and Habitat degradation.

Before Situation:

Heavy woody material (difficult to walk through) resulting from silvicultural/management operations caused both fire hazard, access, potential harm to humans and animals, and pest issues.

After Situation:

Fire, access, and pest issues are reduced with slash spread out and in contact with the ground. An additional benefit is reduced soil movement.

Feature Measure: Acres treated

Scenario Unit: Acres

Scenario Typical Size: 40.0

Scenario Total Cost: $14,445.74

Scenario Cost/Unit: $361.14

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.59	40	$263.60
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	40	$891.60
Mechanical cutter, chopper	943	Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included.	Hours	$90.63	40	$3,625.20
Heavy mechanical site prep, drum chopping	1316	Mechanical operations that pushing trees and vegetation and crushing them with a water filled roller chopper. Requires heavy equipment such as dozers. Includes equipment, power unit and labor costs.	Acres	$123.19	40	$4,927.60
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	80	$1,935.20
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	80	$2,116.80
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	1	$450.03

Practice: 384 - Woody Residue Treatment

Scenario: #7 - Restoration/conservation treatment following catastrophic events

Scenario Description:

The use of a combination of hand (chainsaw) and heavy equipment similar to those used in logging to treat slash resulting from catastrophic events such as fire, wind, severe pest outbreak, ice storm, etc. This scenario will remove/treat the larger material the size of which is consistent with the large equipment used. Resource concerns include: Excessive plant pest pressure, Potential emissions of particulate matter, Wildfire hazard from excessive biomass accumulation, and Habitat degradation.

Before Situation:

A large amount of slash and woody residue is created as a result of a non-silvicultural event such as a wind storm, wildfire, ice storm, pest outbreak, etc. Because the slash and residue is created by a catastrophic event that can cause tree-lodging, snags, broken tops, etc.; treatment is both difficult and dangerous. The presence of this material causes adverse effects on the forest include limiting access for management purposes, increasing the wildfire hazard, increasing the risk of potential harm to humans and livestock, and providing harboring sites for pests.

After Situation:

The material resulting from the catastrophic event is reduced to a level that will minimize the resource concerns.

Feature Measure: Acres of affected forest

Scenario Unit: Acres

Scenario Typical Size: 20.0

Scenario Total Cost: $15,151.82

Scenario Cost/Unit: $757.59

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Track Loader, 95HP	935	Equipment and power unit costs. Labor not included.	Hours	$83.63	40	$3,345.20
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.59	80	$527.20
Log skidder	942	Equipment and power unit costs. Labor not included.	Hours	$114.63	40	$4,585.20
Truck, dump, 8 CY	1401	Dump truck for moving bulk material. Typically capacity is 12 ton or 8 cubic yards. Includes equipment only.	Hours	$54.27	40	$2,170.80
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	80	$1,935.20
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	80	$2,116.80
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 384 - Woody Residue Treatment

Scenario: #8 - Orchard/Vineyard prunings/removals

Scenario Description:

Slash created from orchard/vineyard prunings is chipped or mulched and removed from the site in order to accomplish one or more purposes: reducing wildfire fuels and insect/disease substrate; improving access; and/or reducing potential risk to livestock and humans. Air emission reductions are achieved by chipping or shredding the materials in lieu of burning them. Material may be incorporated in the soil, used as a dust suppressant on unpaved roads or traffic areas. Resource concerns include Wildfire hazard from excessive biomass accumulation and Emissions of particulate matter.

Before Situation:

Wood waste is either burned, creating an air quality issue, or left in place creating a wildfire hazard, an impediment to access, or a potential site for harboring pests. Energy conservation was not implemented.

After Situation:

Treatment of pruning residue results in the reduction in air pollutants, energy conservation occurred, improvement in access, and the reduction of sites that can harbor pests.

Feature Measure: Acres of orchard/vineyard with slas

Scenario Unit: Acres

Scenario Typical Size: 20.0

Scenario Total Cost: $4,953.76

Scenario Cost/Unit: $247.69

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.72	16	$811.52
Brush Chipper, 6 in. capacity	938	Brush Chipper, 6 inch capacity, typically 35 HP. Includes chipper and power unit. Labor not included.	Hours	$28.03	16	$448.48
Truck, dump, 8 CY	1401	Dump truck for moving bulk material. Typically capacity is 12 ton or 8 cubic yards. Includes equipment only.	Hours	$54.27	16	$868.32
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	48	$1,161.12
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	48	$1,270.08
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 384 - Woody Residue Treatment

Scenario: #9 - Woody residue/silvicultural slash treatment- light

Scenario Description:

Treating an area of forest slash to reduce hazardous fuels and the risk of insect and disease, improve organic matter and reduce erosion while improving water quality. Slash is treated with both hand (cutting, lopping, etc.) and mechanically (masticating, chipping, etc.). Typically done by hand and light equipment. Resource concerns include: Wildfire hazard from excessive biomass accumulation and potential Excessive plant pest pressure.

Before Situation:

Woody material resulting from a silvicultural practice such as pruning or a light thinning operation is causing both fire hazard and pest issues.

After Situation:

Fire and pest issues are reduced with slash spread out and in contact with the ground. Additional benefits include reduced soil movement. The soil is protected and/or enhanced.

Feature Measure: Acres treated

Scenario Unit: Acres

Scenario Typical Size: 40.0

Scenario Total Cost: $7,316.93

Scenario Cost/Unit: $182.92

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.59	20	$131.80
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	40	$891.60
Mechanical cutter, chopper	943	Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included.	Hours	$90.63	40	$3,625.20
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	60	$1,451.40
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	40	$1,058.40
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53

Practice: 386 - Field Border

Scenario: #5 - Field Border, Native Species

Scenario Description:

A strip of permanent vegetation established at the edge or around the perimeter of an agricultural field. Practice includes seedbed prep and planting of organic seed for herbaceous species.

Before Situation:

Before practice conditions may vary widely. Fields may have erosion issues from wind or water, a field border may be needed to manage pest populations, protect soil and water quality, provide wildlife food and cover, provide pollinator habitat, or a field border may be used to increase carbon storage and improve air quality. Water quality, soil erosion and/or wildlife food and cover may all be primary resource concerns.

After Situation:

The 386 Implementation Requirements have been developed and applied for the site. This practice when applied around a field may support and connect other buffer practices while creating a buffer between organic systems and conventional cropping systems. Native grasses and legumes will be established in the field border to the extent needed to meet the resource needs and producer objectives. Minimum field border widths shall be based on NRCS local design criteria specific to the purpose for installing the practice. Species selected shall be adapted to the site, not function as a host for diseases of a field crop, and have physical characteristics necessary to control wind and water erosion to tolerable levels on the field border area.

Feature Measure: number of acres

Scenario Unit: Acres

Scenario Typical Size: 1.0

Scenario Total Cost: $161.31

Scenario Cost/Unit: $161.31

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	3	$29.67
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	1	$20.31
Materials						
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$111.33	1	$111.33

Practice: 386 - Field Border

Scenario: #6 - Field Border, Introduced Species

Scenario Description:

A strip of permanent vegetation established at the edge or around the perimeter of an agricultural field. Practice includes seedbed prep and planting of introduced species.

Before Situation:

Before practice conditions may vary widely. Fields may have erosion issues from wind or water, a field border may be needed to manage pest populations, protect soil and water quality, provide wildlife food and cover, provide pollinator habitat, or a field border may be used to increase carbon storage and improve air quality. Water quality, soil erosion and/or wildlife food and cover may all be primary resource concerns.

After Situation:

The 386 Implementation Requirements have been developed and applied for the site. This practice when applied around a field may support and connect other buffer practices within and between fields. Introduced grasses and legumes will be established in the field border to the extent needed to meet the resource needs and producer objectives. Minimum field border widths shall be based on NRCS local design criteria specific to the purpose for installing the practice. Species selected shall be adapted to site, will not function as a host for diseases of a field crop, and have physical characteristics necessary to control wind and water erosion to tolerable levels on the field border area.

Feature Measure: Number of acres

Scenario Unit: Acres

Scenario Typical Size: 1.0

Scenario Total Cost: $85.75

Scenario Cost/Unit: $85.75

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	1	$9.89
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	1	$20.31
Materials						
Nitrogen (N), Urea	71	Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.48	30	$14.40
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.52	20	$10.40
Introduced Perennial Grasses, Legumes and/or Forbs, Low Density	2747	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$30.75	1	$30.75

Practice: 386 - Field Border

Scenario: #7 - Field Border, Pollinator

Scenario Description:

A strip of permanent vegetation established at the edge or around the perimeter of a field. This practice may also apply to recreation land or other land uses where agronomic crops including forages are grown. Practice includes seedbed prep and planting of pollinator friendly species.

Before Situation:

Before practice conditions may vary widely. Fields may have erosion issues from wind or water, a field border may be needed to manage pest populations, protect soil and water quality, provide wildlife food and cover, provide pollinator habitat, or a field border may be used to increase carbon storage and improve air quality. Water quality, soil erosion and/or wildlife food and cover may all be primary resource concerns.

After Situation:

The 386 Implementation Requirements have been developed and applied for the site. This practice when applied around a field may support and connect other buffer practices within and between fields. Pollinator herbaceous plantings will provide species which flower throughout the growing season. This provides a source of nectar for adult pollinators and a diversity of herbaceous material for immature pollinator life stages and for nesting. Minimum field border widths shall be based on NRCS local design criteria specific to the purpose for installing the practice. Species selected shall be adapted to site, will not function as a host for diseases of a field crop, and have physical characteristics necessary to control wind and water erosion to tolerable levels on the field border area.

Feature Measure: Number of acres

Scenario Unit: Acres

Scenario Typical Size: 1.0

Scenario Total Cost: $508.76

Scenario Cost/Unit: $508.76

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	3	$29.67
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	1	$20.31
Materials						
Native Perennial Grasses, Legumes and/or Forb Mix for Targeted Wildlife/Pollinator Habitat or Ecological Restoration, moderate commercial availability	2619	Diverse mix of native perennial grasses, legumes and forbs, less than 50% grasses, may include biennials and a small percentage of annual species for establishment purposes and/or if allowed by the CPS. This is a mix composed of species required to meet specific wildlife/pollinator habitat or ecological requirements. Seed is moderately easy to purchase commercially. Includes materials and shipping.	Acres	$458.78	1	$458.78

Practice: 386 - Field Border

Scenario: #67 - Field Border, Native Species, Forgone Income

Scenario Description:

A strip of permanent vegetation established at the edge or around the perimeter of an agricultural field. Practice includes seedbed prep and planting of native species. The area of the field border is taken out of production.

Before Situation:

Before practice conditions may vary widely. Fields may have erosion issues from wind or water, a field border may be needed to manage pest populations, protect soil and water quality, provide wildlife food and cover, provide pollinator habitat, or a field border may be used to increase carbon storage and improve air quality. Water quality, soil erosion and/or wildlife food and cover may all be primary resource concerns.

After Situation:

The 386 Implementation Requirements have been developed and applied for the site. This practice when applied around a field may support and connect other buffer practices within and between fields. Native grasses, legumes and forbs will be established in the field borders to the extent needed to meet the resource needs and producer objectives. Minimum field border widths shall be based on NRCS local design criteria specific to the purpose for installing the practice. Native species shall be selected that do not function as a host for diseases of a field crop and have physical characteristics necessary to control wind and water erosion to tolerable levels on the field border area.

Feature Measure: number of acres

Scenario Unit: Acres

Scenario Typical Size: 1.0

Scenario Total Cost: $393.07

Scenario Cost/Unit: $393.07

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	3	$29.67
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	1	$20.31
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$215.46	0.5	$107.73
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$248.06	0.5	$124.03
Materials						
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$111.33	1	$111.33

Practice: 388 - Irrigation Field Ditch

Scenario: #1 - Irrigation Field Ditch

Scenario Description:

This scenario is the construction of an Irrigation Field Ditch. Typical construction dimensions are 2' wide bottom x 2' deep x 1320' length with a side slope of 2:1. Resource concerns: Excess/Insufficient Water - Inefficient Use of Irrigation Water Associated Conservation Practices: 320-Irrigation Canal or Lateral; 443-Irrigation System, Surface or Subsurface Water; 533-Pumping Plant; 430-Irrigation Pipeline.

Before Situation:

Water supply for an area is inadequate for crop production and irrigation water application is inefficient.

After Situation:

An earthen canal that has adequate capacity to convey sufficient irrigation water to meet the demands of the system and make irrigation practical for the crops being grown.

Feature Measure: Volume of earth excavated

Scenario Unit: Cubic Yards

Scenario Typical Size: 587.0

Scenario Total Cost: $1,538.02

Scenario Cost/Unit: $2.62

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	587	$1,220.96
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	2	$317.06

Practice: 390 - Riparian Herbaceous Cover

Scenario: #1 - Aquatic Wildlife

Scenario Description:

Aquatic Wildlife: This scenario addresses inadequate herbaceous plant community function or diversity within the specific transitional zone between terrestrial and aquatic habitats in rangeland, pasture, cropland, and forest where natural seeding methods and/or management is unlikely to improve the plant community within a reasonable time period. This scenario applies to work not covered under NRCS Conservation Practice Range Planting (528), Forage and Biomass Planting (512), Critical Area Planting (342), Filter Strip (393), Restoration and Management of Rare and Declining Habitats (643), Streambank and Shoreline Protection (580), Vegetated Treatment Area (635), Wetland Enhancement (659), or Wetland Restoration (657). This practice can be used nation wide. The typical setting for this scenario is usually a narrow strip between the aquatic and terrestrial habitats subject to intermittant flooding and saturated soils where the exising plant community has been disturbed, destroyed, or the species diversity is unable to provide adequate habitat. Where the establishment of a diverse riparian herbaceous plant community is desired, an adapted mix of grasses, sedges, rushes, ferns, legumes, and/or forbs tolerant to the site conditions will be planted. Grasses such as prairie cordgrass (Spartina pectinata), sedges, rushes, and/or ferns will be planted using plugs. Additional site adapted species of grasses, legumes, and/or forbs may be added by broadcast and/or no-till or range drill seeding methods as necessary to accomplish the intended purpose(s). Where chemical control of undesirable vegetation, including invasives, is required to reduce competition for the desired plant community the Herbaceous Weed Control (315) practice should be used. Seedbed preparation may require LIGHT TILLAGE (disking). WHEN POLLINATOR HABITAT IS A CONSIDERATION: Include 5-10 adapted forb species that bloom sequentially throughout the growing season where feasible. To address the high diversity of riparian plant communities and their adjacent stream types that exist from the tropics to the tundra, and the deserts, prairies, mountains, and lowlands across the various regions and/or MLRA's, up to 20 adapted riparian plant community-specific scenarios may be required.

Before Situation:

The riparian zone, the specific area between terrestrial and aquatic habitats, vegetation is currently an undesirable or inadequate stand of perennial or annual vegetation as determined by the NRCS Stream Visual Assessment Protocol score of less than 5 for those elements and natural reseeding or vegetation management is unlikely to improve the plant community within a reasonable amount of time. Existing vegetation does not provide adequate food, cover, and/or connectivity for riparian wildlife, and contributes insufficient amounts of organic matter for stream species food and cover. Riparian vegetation quality and/or quantity have been compromised by human activities and/or access of vehicles, people, and/or livestock to the extent that the riparian area and floodplain are not functioning to provide the necessary stream and riparian habitat components. Existing conditions often require suppression or eradication of current vegetation by conventional mechanical or chemical (Herbaceous Weed Control (315)) methods to ensure establishment success of the new planting. Soil quality may be reduced due to compaction and may require light tillage to prepare a proper seedbed.

After Situation:

The riparian zone, the transitional zone between the terrestrial and aquatic habitats, is established to an adapted, diverse vegetative plant community and is under close management to insure long term survival and ecological succession. The quality and quantity of the riparian zone components are managed to support the species that depend on it for habitat as well as the functions it performs for stabilizing the streambank and/or shoreline, dissipating stream energy and trapping sediment, and improving and/or maintaining water quality. These functions include: stream temperature moderation through shading, recruitment of non-woody organic matter, habitat for terrestrial insects and other riparian dependent species, streambank integrity, and filtration of contaminants from surface run-off into the stream.

Feature Measure: Acres of Riparian Herbaceous Cover

Scenario Unit: Acres

Scenario Typical Size: 0.5

Scenario Total Cost: $1,556.13

Scenario Cost/Unit: $3,112.26

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	1	$9.89
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	1	$20.31
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$46.88	1	$46.88
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	40	$967.60
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	2	$52.92
Materials						
Native Aquatic Plants, Emergent or Submerged	2336	Native aquatic emergent or submerged. All required materials for establishing vegetation. Includes material and shipping.	Each	$1.00	300	$300.00
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53

Practice: 390 - Riparian Herbaceous Cover

Scenario: #2 - Plugging and Seeding

Scenario Description:

Plugging: This scenario addresses inadequate herbaceous plant community function or diversity within the specific transitional zone between terrestrial and aquatic habitats in rangeland, pasture, cropland, and forest where natural seeding methods and/or management is unlikely to improve the plant community within a reasonable time period. This scenario applies to work not covered under NRCS Conservation Practice Range Planting (528), Forage and Biomass Planting (512), Critical Area Planting (342), Filter Strip (393), Restoration and Management of Rare and Declining Habitats (643), Streambank and Shoreline Protection (580), Vegetated Treatment Area (635), Wetland Enhancement (659), or Wetland Restoration (657). This practice can be used nation wide. The typical setting for this scenario is usually a narrow strip between the aquatic and terrestrial habitats subject to intermittant flooding and saturated soils where the exising plant community has been disturbed, destroyed, or the species diversity is unable to provide proper function and/or adequate habitat. Where the establishment of a diverse riparian herbaceous plant community is desired, an adapted mix of grasses, sedges, rushes, ferns, legumes, and/or forbs tolerant to the site conditions will be planted. Grasses such as prairie cordgrass (Spartina pectinata), sedges, rushes, and/or ferns will be planted using plugs. Additional site adapted species of grasses, legumes, and/or forbs may be added by broadcast and/or no-till or range drill seeding methods as necessary to accomplish the intended purpose(s). Where chemical control of undesirable vegetation, including invasives, is required to reduce competition for the desired plant community the Herbaceous Weed Control (315) practice should be used. Seedbed preparation may require LIGHT TILLAGE (disking). WHEN POLLINATOR HABITAT IS A CONSIDERATION: Include 5-10 adapted forb species that bloom sequentially throughout the growing season where feasible. To address the high diversity of riparian plant communities and their adjacent stream types that exist from the tropics to the tundra, and the deserts, prairies, mountains, and lowlands across the various regions and/or MLRA's, up to 20 adapted riparian plant community-specific scenarios may be required

Before Situation:

The riparian zone, the specific area between terrestrial and aquatic habitats, is currently an undesirable or inadequate stand of perennial or annual vegetation and natural reseeding or vegetation management is unlikely to improve the plant community within a reasonable amount of time to adequately address streambank and/or shoreline stability, dissipate stream energy and trap sediment, improve and/or maintain water quality, and/or provide adequate habitat corridors, food and/or cover for fish, wildlife, pollinators, and/or livestock resource conern(s). Existing conditions often require suppression or eradication of current vegetation by conventional mechanical or chemical (Herbaceous Weed Control (315)) methods to ensure establishment success of the new planting.

After Situation:

The riparian zone, the transitional zone between the terrestrial and aquatic habitats, is established to an adapted, diverse vegetative plant community and is under close management to insure long term survival and ecological succession. The quality and quantity of the riparian zone components are managed to support the species that depend on it for habitat as well as the functions it performs for stabilizing the streambank and/or shoreline, dissipating stream energy and trapping sediment, and improving and/or maintaining water quality. These functions include: stream temperature moderation through shading, recruitment of non-woody organic matter, habitat for terrestrial insects and other riparian dependent species, streambank integrity, and filtration of contaminants from surface run-off into the stream.

Feature Measure: Acres of Riparian Herbaceous Cover

Scenario Unit: Acres

Scenario Typical Size: 0.5

Scenario Total Cost: $1,652.02

Scenario Cost/Unit: $3,304.03

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	1	$9.89
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	1	$20.31
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$46.88	2	$93.76
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	40	$967.60
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	2	$52.92
Materials						
Native Aquatic Plants, Emergent or Submerged	2336	Native aquatic emergent or submerged. All required materials for establishing vegetation. Includes material and shipping.	Each	$1.00	100	$100.00
Native Perennial Grasses, Legumes and/or Forbs, Low Density	2753	A mix of native perennial grasses, legumes, and/or forbs, grasses typically greater than 50% of the mix, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Species typically easy to purchase. Includes material and shipping.	Acres	$180.95	0.5	$90.48
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	2	$317.06

Practice: 390 - Riparian Herbaceous Cover

Scenario: #3 - Warm & Cool Season Plants

Scenario Description:

Warm & Cool Season Grasses with Forbs: This scenario addresses inadequate herbaceous plant community function or diversity within the specific transitional zone between terrestrial and aquatic habitats in rangeland, pasture, cropland, and forest where natural seeding methods and/or management is unlikely to improve the plant community within a reasonable time period. This scenario applies to work not covered under NRCS Conservation Practice Range Planting (528), Forage and Biomass Planting (512), Critical Area Planting (342), Filter Strip (393), Restoration and Management of Rare and Declining Habitats (643), Streambank and Shoreline Protection (580), Vegetated Treatment Area (635), Wetland Enhancement (659), or Wetland Restoration (657). This practice can be used nation wide. The typical setting for this scenario is usually a narrow strip between the aquatic and terrestrial habitats subject to intermittant flooding and saturated soils where the exising plant community has been disturbed, destroyed, or the species diversity is unable to provide proper function and/or adequate habitat. Where the establishment of a diverse riparian herbaceous plant community is desired, an adapted mix of primarily warm season grasses, legumes, and/or forbs tolerant to the site conditions will be planted by broadcast and/or no-till or range drill seeding methods as necessary to accomplish the intended purpose(s). Where chemical control of undesirable vegetation, including invasives, is required to reduce competition for the desired plant community the Herbaceous Weed Control (315) practice should be used. Seedbed preparation may require LIGHT TILLAGE (disking). WHEN POLLINATOR HABITAT IS A CONSIDERATION: Include 5-10 adapted forb species that bloom sequentially throughout the growing season where feasible. To address the high diversity of riparian plant communities and their adjacent stream types that exist from the tropics to the tundra, and the deserts, prairies, mountains, and lowlands across the various regions and/or MLRA's, up to 20 adapted riparian plant community-specific scenarios may be required

Before Situation:

The riparian zone, the specific area between terrestrial and aquatic habitats, is currently an undesirable or inadequate stand of perennial or annual vegetation and natural reseeding or vegetation management is unlikely to improve the plant community within a reasonable amount of time to adequately address streambank and/or shoreline stability, dissipate stream energy and trap sediment, improve and/or maintain water quality, and/or provide adequate habitat corridors, food and/or cover for fish, wildlife, pollinators, and/or livestock resource conern(s). Existing conditions often require suppression or eradication of current vegetation by conventional mechanical or chemical (Herbaceous Weed Control (315)) methods to ensure establishment success of the new planting.

After Situation:

The riparian zone, the transitional zone between the terrestrial and aquatic habitats, is established to an adapted, diverse vegetative plant community and is under close management to insure long term survival and ecological succession. The quality and quantity of the riparian zone components are managed to support the species that depend on it for habitat as well as the functions it performs for stabilizing the streambank and/or shoreline, dissipating stream energy and trapping sediment, and improving and/or maintaining water quality. These functions include: stream temperature moderation through shading, recruitment of non-woody organic matter, habitat for terrestrial insects and other riparian dependent species, streambank integrity, and filtration of contaminants from surface run-off into the stream.

Feature Measure: Acres of Riparian Herbaceous Cover

Scenario Unit: Acres

Scenario Typical Size: 0.5

Scenario Total Cost: $785.00

Scenario Cost/Unit: $1,569.99

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	1	$9.89
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	1	$9.89
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	1	$20.31
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	1	$20.31
Materials						
Native Perennial Grasses, Legumes and/or Forbs, Low Density	2753	A mix of native perennial grasses, legumes, and/or forbs, grasses typically greater than 50% of the mix, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Species typically easy to purchase. Includes material and shipping.	Acres	$180.95	0.5	$90.48
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	2	$317.06
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	2	$317.06

Practice: 391 - Riparian Forest Buffer

Scenario: #2 - Cuttings

Scenario Description:

Establish a buffer of trees and/or shrubs into a suitably prepared site to restore riparian plant communities and associated benefits. The buffer will be located adjacent to and up-gradient from a watercourse or water body extending a minimum of 35 feet wide. The planting will consist of tree and/or shrub poles and live stakes (whips) planted by hand. Materials will be from a nearby, off-site location. The ratio of whips to poles will be 5:1. The cuttings will be planted in a mosaic pattern while still dormant. Tree mesh will be placed on the large cuttings. Resource concerns to be addressed are Soil Erosion - excessive bank erosion; Water Quality - excess sediment and organics in surface waters and elevated temperature; Degraded Plant Condition - inadequate structure and composition; and Inadequate Habitat for Fish and Wildlife - habitat degradation.

Before Situation:

Typical sites include former riparian forests and habitat used for forage, cropland, speculation property, or other nonforest condition which contains undesirable amounts or types of vegetation. Active bank erosion is depositing sediment, nutrients and organics in the riparian area. Water temperature is high due to lack of shade. Habitat is not desirable for wildlife.

After Situation:

A buffer of trees and shrubs will be established along the riparian corridor which will provide stability, filtration, shade, and desirable habitat to address the above mentioned resource concerns.

Feature Measure: Area of planting

Scenario Unit: Acres

Scenario Typical Size: 1.0

Scenario Total Cost: $5,444.89

Scenario Cost/Unit: $5,444.89

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hours	$11.75	10	$117.50
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	10	$222.90
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$19.49	10	$194.90
Tractor, agricultural, 30 HP	1501	Agricultural tractor with horsepower range of less than 50. Equipment and power unit costs. Labor not included.	Hours	$8.13	10	$81.30
Trailer, flatbed, small	1505	Small flatbed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included.	Hours	$7.55	10	$75.50
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$11.47	10	$114.70
Water tank, portable	1602	Portable water tank transported in a pick up truck. Typically with 200 gallon capacity includes tank with pump, hose and sprayer. Does not include the pickup truck. Equipment only.	Hours	$12.92	10	$129.20
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	70	$1,693.30
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	10	$264.60
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	4	$444.84
Materials						
Tree & Shrub, Woody, Cuttings, Medium	1308	Woody cuttings, live stakes or whips typically 1/4 to 1 inch diameter and 24 to 48 inches long. Includes materials and shipping only.	Each	$0.89	250	$222.50
Tree & Shrub, Woody, Cuttings, Large	1309	Woody pole cuttings or posts 2 to 6 inches in diameter and 6 ft. long. Includes materials and shipping only.	Each	$14.97	50	$748.50
Tree shelter, mesh tree tube, 48 in.	1556	48 inch tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only.	Each	$1.02	50	$51.00
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	4	$634.12

Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	1	$450.03

Practice: 391 - Riparian Forest Buffer

Scenario: #3 - Bare-root, hand planted

Scenario Description:

Establish a buffer of trees and/or shrubs into a suitably prepared site to restore riparian plant communities and associated benefits. The buffer will be located adjacent to and up-gradient from a watercourse or water body extending a minimum of 35 feet wide. The planting will consist of hand planted bare-root shrubs, evergreen, and deciduous trees. One third of the area will be planted to each woody plant type. Planting for shrubs will be done at 6' x 6' spacing, evergreen tree spacing will be 12' x 15' and deciduous tree spacing at 15' x 15'. Tree shelters will be placed on the hardwoods and evergreens. Resource concerns to be addressed are Soil Erosion - excessive bank erosion; Water Quality - excess sediment and organics in surface waters and elevated temperature; Degraded Plant Condition - inadequate structure and composition; and Inadequate Habitat for Fish and Wildlife - habitat degradation.

Before Situation:

Typical sites include former riparian forests and habitat used for forage, cropland, speculation property, or other nonforest condition which contains undesirable amounts or types of vegetation. Active bank erosion is depositing sediment, nutrients and organics in the riparian area. Water temperature is high due to lack of shade. Habitat is not desirable for wildlife.

After Situation:

A buffer of trees and shrubs will be established along the riparian corridor which will provide stability, filtration, shade, and desirable habitat to address the above mentioned resource concerns.

Feature Measure: Area of planting

Scenario Unit: Acres

Scenario Typical Size: 3.0

Scenario Total Cost: $7,120.40

Scenario Cost/Unit: $2,373.47

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	8	$178.32
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$19.49	16	$311.84
Trailer, enclosed, small	1503	Small enclosed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included.	Hours	$10.75	8	$86.00
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$11.47	16	$183.52
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	112	$2,709.28
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	16	$725.44
Materials						
Shrub, Seedling, Medium	1507	Bare root shrub seedling, 18 to 36 inches tall; includes tropical containerized seedlings 10 to 20 cubic inches. Includes materials and shipping only.	Each	$1.41	800	$1,128.00
Tree, Hardwood, Seedling, Medium	1510	Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only.	Each	$1.52	200	$304.00
Tree, Conifer, Seedling, Small	1512	Containerized conifer seedlings, 4 or 6 cubic inches; or bare root conifer seedlings 1+0 (one-year old seedlings grown in their original seedbed). Includes materials and shipping only.	Each	$0.51	200	$102.00
Tree shelter, solid tube type, 4 in. x 36 in	1565	4 inch x 36 inch tree tube for protection from animal damage. Materials only.	Each	$2.78	400	$1,112.00
Stakes, wood, 1 in. x 1 in. x 36 in.	1577	1 in. x 1 in. x 36 in. wood stakes to fasten items in place. Includes materials only.	Each	$0.70	400	$280.00

Practice: 391 - Riparian Forest Buffer

Scenario: #4 - Bare-root, machine planted

Scenario Description:

Establish a buffer of trees and/or shrubs into a suitably prepared site to restore riparian plant communities and associated benefits. The buffer will be located adjacent to and up-gradient from a watercourse or water body extending a minimum of 35 feet wide. The planting will consist of machine planted bare-root shrubs, evergreen, and deciduous trees. One third of the area will be planted to each woody plant type. Planting for shrubs will be done at 6' x 6' spacing, evergreen tree spacing will be 12' x 15' and deciduous tree spacing at 15' x 15'. Tree shelters will be placed on the hardwoods and evergreens. Resource concerns to be addressed are Soil Erosion - excessive bank erosion; Water Quality - excess sediment and organics in surface waters and elevated temperature; Degraded Plant Condition - inadequate structure and composition; and Inadequate Habitat for Fish and Wildlife - habitat degradation.

Before Situation:

Typical sites include former riparian forests and habitat used for forage, cropland, speculation property, or other nonforest condition which contains undesirable amounts or types of vegetation. Active bank erosion is depositing sediment, nutrients and organics in the riparian area. Water temperature is high due to lack of shade. Habitat is not desirable for wildlife.

After Situation:

A buffer of trees and shrubs will be established along the riparian corridor which will provide stability, filtration, shade, and desirable habitat to address the above mentioned resource concerns.

Feature Measure: Area of planting

Scenario Unit: Acres

Scenario Typical Size: 3.0

Scenario Total Cost: $3,984.93

Scenario Cost/Unit: $1,328.31

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$21.30	8	$170.40
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$19.49	8	$155.92
Mechanical tree planter	1600	Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor.	Hours	$5.49	8	$43.92
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	24	$580.56
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	8	$211.68
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	8	$362.72
Materials						
Shrub, Seedling, Medium	1507	Bare root shrub seedling, 18 to 36 inches tall; includes tropical containerized seedlings 10 to 20 cubic inches. Includes materials and shipping only.	Each	$1.41	400	$564.00
Tree, Hardwood, Seedling, Medium	1510	Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only.	Each	$1.52	160	$243.20
Tree, Conifer, Seedling, Small	1512	Containerized conifer seedlings, 4 or 6 cubic inches; or bare root conifer seedlings 1+0 (one-year old seedlings grown in their original seedbed). Includes materials and shipping only.	Each	$0.51	200	$102.00
Tree shelter, solid tube type, 4 in. x 36 in	1565	4 inch x 36 inch tree tube for protection from animal damage. Materials only.	Each	$2.78	400	$1,112.00
Stakes, wood, 1 in. x 1 in. x 36 in.	1577	1 in. x 1 in. x 36 in. wood stakes to fasten items in place. Includes materials only.	Each	$0.70	400	$280.00
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53

Practice: 391 - Riparian Forest Buffer

Scenario: #5 - Small container, hand planted

Scenario Description:

Establish a buffer of trees and/or shrubs into a suitably prepared site to restore riparian plant communities and associated benefits. The buffer will be located adjacent to and up-gradient from a watercourse or water body extending a minimum of 35 feet wide. The planting will consist of hand planted small containerized shrubs, evergreen, and deciduous trees. All seedlings will be planted at 15 foot by 15 foot spacing. Shrubs will be planted immediately adjacent to the waterbody. Tree shelters wil be placed on all plant materials. Resource concerns to be addressed are Soil Erosion - excessive bank erosion; Water Quality - excess sediment and organics in surface waters and elevated temperature; Degraded Plant Condition - inadequate structure and composition; and Inadequate Habitat for Fish and Wildlife - habitat degradation.

Before Situation:

Typical sites include former riparian forests and habitat used for forage, cropland, speculation property, or other nonforest condition which contains undesirable amounts or types of vegetation. Active bank erosion is depositing sediment, nutrients and organics in the riparian area. Water temperature is high due to lack of shade. Habitat is not desirable for wildlife.

After Situation:

A buffer of trees and shrubs will be established along the riparian corridor which will provide stability, filtration, shade, and desirable habitat to address the above mentioned resource concerns.

Feature Measure: Area of planting

Scenario Unit: Acres

Scenario Typical Size: 3.0

Scenario Total Cost: $10,699.70

Scenario Cost/Unit: $3,566.57

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	16	$356.64
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$19.49	16	$311.84
Trailer, enclosed, small	1503	Small enclosed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included.	Hours	$10.75	16	$172.00
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$11.47	16	$183.52
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	112	$2,709.28
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	16	$725.44
Materials						
Shrub, Potted, Small	1524	Potted shrub seedling, 1 quart to 1 gallon. Includes materials and shipping only.	Each	$6.41	194	$1,243.54
Tree, Hardwood, Potted, Small	1529	Potted hardwood seedling, 1 quart to 1 gallon. Includes materials and shipping only.	Each	$7.78	194	$1,509.32
Tree, Conifer, Potted, Small	1534	Potted conifer seedling, 1 quart to 1 gallon. Includes materials and shipping only.	Each	$5.71	194	$1,107.74
Tree shelter, mesh tree tube, 48 in.	1556	48 inch tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only.	Each	$1.02	194	$197.88
Tree shelter, solid tube type, 4 in. x 24 in.	1563	4 inch x 24 inch tree tube for protection from animal damage. Materials only.	Each	$2.05	194	$397.70
Tree shelter, solid tube type, 4 in. x 48 in.	1566	4 inch x 48 inch tree tube for protection from animal damage. Materials only.	Each	$4.22	194	$818.68
Stakes, wood, 1 in. x 1 in. x 48 in.	1578	1 in. x 1 in. x 48 in. wood stakes to fasten items in place. Includes materials only.	Each	$1.66	582	$966.12

Practice: 391 - Riparian Forest Buffer

Scenario: #6 - Small container, machine planted

Scenario Description:

Establish a buffer of trees and/or shrubs into a suitably prepared site to restore riparian plant communities and associated benefits. The buffer will be located adjacent to and up-gradient from a watercourse or water body extending a minimum of 35 feet wide. The planting will consist of machine planted small containerized shrubs, evergreen, and deciduous trees. All seedlings will be planted at 15 feet by 15 feet spacing. Shrubs will be planted immediately adjacent to the water body. Tree shelters will be placed on all plant materials. Resource concerns to be addressed are Soil Erosion - excessive bank erosion; Water Quality - excess sediment and organics in surface waters and elevated temperature; Degraded Plant Condition - inadequate structure and composition; and Inadequate Habitat for Fish and Wildlife - habitat degradation.

Before Situation:

Typical sites include former riparian forests and habitat used for forage, cropland, speculation property, or other nonforest condition which contains undesirable amounts or types of vegetation. Active bank erosion is depositing sediment, nutrients and organics in the riparian area. Water temperature is high due to lack of shade. Habitat is not desirable for wildlife.

After Situation:

A buffer of trees and shrubs will be established along the riparian corridor which will provide stability, filtration, shade, and desirable habitat to address the above mentioned resource concerns.

Feature Measure: Area of planting

Scenario Unit: Acres

Scenario Typical Size: 3.0

Scenario Total Cost: $7,568.30

Scenario Cost/Unit: $2,522.77

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$21.30	8	$170.40
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$19.49	8	$155.92
Mechanical tree planter	1600	Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor.	Hours	$5.49	8	$43.92
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	24	$580.56
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	8	$211.68
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	8	$362.72
Materials						
Shrub, Potted, Small	1524	Potted shrub seedling, 1 quart to 1 gallon. Includes materials and shipping only.	Each	$6.41	194	$1,243.54
Tree, Hardwood, Potted, Small	1529	Potted hardwood seedling, 1 quart to 1 gallon. Includes materials and shipping only.	Each	$7.78	194	$1,509.32
Tree, Conifer, Potted, Small	1534	Potted conifer seedling, 1 quart to 1 gallon. Includes materials and shipping only.	Each	$5.71	194	$1,107.74
Tree shelter, solid tube type, 4 in. x 24 in.	1563	4 inch x 24 inch tree tube for protection from animal damage. Materials only.	Each	$2.05	194	$397.70
Tree shelter, solid tube type, 4 in. x 48 in.	1566	4 inch x 48 inch tree tube for protection from animal damage. Materials only.	Each	$4.22	194	$818.68
Stakes, wood, 1 in. x 1 in. x 48 in.	1578	1 in. x 1 in. x 48 in. wood stakes to fasten items in place. Includes materials only.	Each	$1.66	582	$966.12

Practice: 391 - Riparian Forest Buffer

Scenario: #7 - large container, hand planted

Scenario Description:

Establish a buffer of trees and/or shrubs into a suitably prepared site to restore riparian plant communities and associated benefits. The buffer will be located adjacent to and up-gradient from a watercourse or water body extending a minimum of 35 feet wide. The planting will consist of hand planted large containerized shrubs, evergreen, and deciduous trees. Planting for shrubs will be done at 20' x 20' spacing Shrubs will be planted immediately adjacent to the water body. Evergreen and deciduous trees will be planted at approximately 30 feet X 30 feet spacing. Tree shelters will be placed on all planting stock. Resource concerns to be addressed are Soil Erosion - excessive bank erosion; Water Quality - excess sediment and organics in surface waters and elevated temperature; Degraded Plant Condition - inadequate structure and composition; and Inadequate Habitat for Fish and Wildlife - habitat degradation.

Before Situation:

Typical sites include former riparian forests and habitat used for forage, cropland, speculation property, or other nonforest condition which contains undesirable amounts or types of vegetation. Active bank erosion is depositing sediment, nutrients and organics in the riparian area. Water temperature is high due to lack of shade. Habitat is not desirable for wildlife.

After Situation:

A buffer of trees and shrubs will be established along the riparian corridor which will provide stability, filtration, shade, and desirable habitat to address the above mentioned resource concerns.

Feature Measure: Area of planting

Scenario Unit: Acres

Scenario Typical Size: 3.0

Scenario Total Cost: $14,756.56

Scenario Cost/Unit: $4,918.85

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.72	16	$811.52
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	32	$713.28
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$19.49	16	$311.84
Trailer, enclosed, small	1503	Small enclosed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included.	Hours	$10.75	16	$172.00
Trailer, flatbed, small	1505	Small flatbed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included.	Hours	$7.55	16	$120.80
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$11.47	16	$183.52
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	320	$7,740.80
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	16	$423.36
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	16	$725.44
Materials						
Shrub, Potted, Medium	1527	Potted shrub seedling, 2 gallons or larger. Includes materials and shipping only.	Each	$13.67	100	$1,367.00
Tree, Hardwood, Potted, Medium	1532	Potted hardwood seedling, 2 gallons or larger. Includes materials and shipping only.	Each	$14.60	50	$730.00
Tree, Conifer, Potted, Medium	1537	Potted conifer seedling, 2 gallons or larger. Includes materials and shipping only.	Each	$13.76	50	$688.00
Tree shelter, mesh tree tube, 48 in.	1556	48 inch tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only.	Each	$1.02	50	$51.00
Tree shelter, solid tube type, 4 in. x 24 in.	1563	4 inch x 24 inch tree tube for protection from animal damage. Materials only.	Each	$2.05	100	$205.00
Tree shelter, solid tube type, 4 in. x 60 in.	1567	4 inch x 60 inch tree tube for protection from animal damage. Materials only.	Each	$4.26	50	$213.00
Stakes, wood, 3/4 in. x 3/4 in. x 60 in.	1583	3/4 in. x 3/4 in. x 60 in. wood stakes to fasten items in place. Includes materials only.	Each	$1.50	200	$300.00

Practice: 393 - Filter Strip

Scenario: #5 - Filter Strip, Native species

Scenario Description:

A strip or area of herbaceous vegetation that removes contaminants from overland flow. Practice includes seedbed prep and planting of native species.

Before Situation:

Annual cropland, grazing land, or disturbed land (including forestland) allows for runoff of suspended solids, dissolved and/or associated contaminants into environmentally-sensitive areas such as wetlands, riparian zones, critical habitat and neighboring nonagricultural properties. Water Quality resource concerns are associated with this practice.

After Situation:

The 393 Implementation Requirements are developed for the site and applied. The planned filter strip will be established and maintained per the practice plan that will meet the criteria for the planned purpose(s). The vegetation will consist of native species. The filter strip will have adequate width to filter the planned pollutants. The practice includes seedbed preparation, seeding, and seed. Species selected shall be able to withstand partial burial by sediment and tolerant of herbicides used on contribution area while protecting environmentally-sensitive areas.

Feature Measure: number of acres

Scenario Unit: Acres

Scenario Typical Size: 1.0

Scenario Total Cost: $238.27

Scenario Cost/Unit: $238.27

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	3	$29.67
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	1	$20.31
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$19.49	1.5	$29.24
Materials						
Native Perennial Grasses, Medium Density	2751	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to higher density (41-60 pure live seeds/sq ft). Includes material and shipping.	Acres	$159.05	1	$159.05

Practice: 393 - Filter Strip

Scenario: #6 - Filter Strip, Introduced species

Scenario Description:

A strip or area of herbaceous vegetation that removes contaminants from overland flow. Practice includes seedbed prep and planting of introduced species.

Before Situation:

Annual cropland, grazing land, or disturbed land (including forestland) allows for runoff of suspended solids, dissolved and/or associated contaminants into environmentally-sensitive areas such as wetlands, riparian zones, critical habitat and neighboring nonagricultural properties. Water Quality resource concerns are associated with this practice.

After Situation:

The 393 Implementation Requirements are developed for the site and applied. The planned filter strip will be established and maintained per the practice plan that will meet the criteria for the planned purpose(s). The vegetation will consist of introduced species. The filter strip will have adequate width to filter the planned pollutants. The practice includes seedbed preparation, seeding, and seed. Species selected shall be able to withstand partial burial by sediment and tolerant of herbicides used on contribution area while protecting environmentally-sensitive areas.

Feature Measure: Number of acres

Scenario Unit: Acres

Scenario Typical Size: 1.0

Scenario Total Cost: $167.24

Scenario Cost/Unit: $167.24

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	3	$29.67
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.12	1	$6.12
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	1	$20.31
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$19.49	1.5	$29.24
Materials						
Nitrogen (N), Urea	71	Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.48	30	$14.40
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.52	20	$10.40
Introduced Perennial Grasses, Legumes and/or Forbs, High Density	2749	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Includes material and shipping.	Acres	$57.10	1	$57.10

Practice: 394 - Firebreak

Scenario: #1 - Constructed - Light Equipment

Scenario Description:

Installation of a bare-ground firebreak of a minimum width of 15' around a 20 acre field/farm using farm equipment (2 passes). Generally water control devices such as water bars are not needed due either to the lack of steep terrain or the temporary nature of the firebreak. Resource concerns include Wildfire hazard from excessive biomass accumulation, Undesirable plant productivity and health, Inadequate plant structure and composition, and Habitat degradation.

Before Situation:

Tract, field, or farm lacks adequate firebreaks to either reduce the spread of wildfires or contain a prescribed burn. Installation will be accomplished by making two passes with the use of typical farm equipment such as tractors, plows, disks, or similar implements.

After Situation:

The property is adequately protected from wildfire or can be safely prescribe burned.

Feature Measure: Area of Firebreak

Scenario Unit: Acres

Scenario Typical Size: 1.3

Scenario Total Cost: $142.94

Scenario Cost/Unit: $109.95

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	2	$44.58
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	2	$19.78
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acres	$15.10	2	$30.20
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	2	$48.38

Practice: 394 - Firebreak

Scenario: #2 - Constructed - Medium equipment, flat-medium slopes

Scenario Description:

Use of medium equipment such as small dozers to blade, disk, plow, etc. 10' wide bare-soil firebreaks on slopes less than 15%. Generally, water control devices such as water bars are limited to 10 or less per 1,000 feet when properly planned and installed using the same equipment. Resource concerns include Wildfire hazards from excessive biomass accumulation, Undesirable plant productivity and health, Inadequate plant structure and composition, and Habitat degradation.

Before Situation:

Tract, field, or farm lacks adequate firebreaks to either reduce the spread of wildfires or contain a prescribed burn. Conditions such as topography, the presence of brush and trees, etc. make the use of typical farm equipment impractical.

After Situation:

The property is adequately protected from wildfire or can be safely prescribe burned and the potential for excessive erosion from the firebreak is negligible.

Feature Measure: Area of Firebreak

Scenario Unit: Acres

Scenario Typical Size: 1.3

Scenario Total Cost: $1,019.33

Scenario Cost/Unit: $784.10

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.89	4	$203.56
Water Bars	1500	Installation of graded trail water controlling structures such as water bars, broad based dips for erosion control. Typical cross section is 1.5 feet high with 4:1 side slopes yielding about 0.33 CY/ft of length.	Feet	$2.97	150	$445.50
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	4	$134.56
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 394 - Firebreak

Scenario: #3 - Constructed - Medium equipment, steep slopes

Scenario Description:

Use of medium equipment such as small dozers to blade, disk, plow, etc. 10' wide bare-soil firebreaks on slopes less than 15%. Generally, water control devices such as water bars are limited to 10 or less per 1,000 feet when properly planned and installed using the same equipment. Resource concerns include Wildfire hazards from excessive biomass accumulation, Undesirable plant productivity and health, Inadequate plant structure and composition, and Habitat degradation.

Before Situation:

Tract, field, or farm lacks adequate firebreaks to either reduce the spread of wildfires or contain a prescribed burn. Conditions such as topography, the presence of brush and trees, etc. make the use of typical farm equipment impractical. As slopes increase, the potential for excessive erosion increases from soil disturbances. Therefore the installation of water control devices such as water bars will be important in protecting the resource base.

After Situation:

The property is adequately protected from wildfire or can be safely prescribe burned and the potential for excessive erosion from the firebreak is minimized.

Feature Measure: Area of Firebreak

Scenario Unit: Acres

Scenario Typical Size: 0.5

Scenario Total Cost: $1,242.08

Scenario Cost/Unit: $2,484.16

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.89	4	$203.56
Water Bars	1500	Installation of graded trail water controlling structures such as water bars, broad based dips for erosion control. Typical cross section is 1.5 feet high with 4:1 side slopes yielding about 0.33 CY/ft of length.	Feet	$2.97	225	$668.25
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	4	$134.56
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 394 - Firebreak

Scenario: #4 - Vegetated permanent firebreak

Scenario Description:

Establishing a wide strip of permanent vegetation that will serve as a green firebreak. Scenario includes clearing the site, preparing the seedbed, seeding (typically cool season grasses and/or legumes), and applying needed soil amendments. Seedbed preparation and vegetation establishment will be accomplished with farm equipment. Soil amendments will be applied according to local FOTG guidance. This scenario does not include follow-up maintenance operations such as weed control. mowing, etc. Resource concerns include Wildfire hazard from excessive biomass accumulation, Soil erosion, and Excessive sediment in surface waters.

Before Situation:

Tract, field, or farm lacks adequate firebreaks to either reduce the spread of wildfires or contain a prescribed burn.

After Situation:

The property is adequately protected from wildfire or can be safely prescribe burned. Wildlife habitat will also be enhanced and the potential for erosion from the firebreak is minimized.

Feature Measure: Area of Firebreak

Scenario Unit: Acres

Scenario Typical Size: 10.0

Scenario Total Cost: $1,201.71

Scenario Cost/Unit: $120.17

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	4	$89.16
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	10	$98.90
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acres	$15.10	10	$151.00
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	10	$203.10
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	8	$193.52
Materials						
Introduced Perennial Grasses, Legumes and/or Forbs, Low Density	2747	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$30.75	10	$307.50
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53

Practice: 394 - Firebreak

Scenario: #5 - Constructed - Wide, bladed or disked firebreak

Scenario Description:

Installing a bare-ground firebreak with a width of 30' or more on gently to strongly sloping slopes with equipment such as a dozer with a heavy disk. Using smaller equipment, erosion control devices such as water bars will be installed at approximately 15 to 25 per 1,000 feet of firebreak length. Devices will have stable outlets. Resource concerns include Wildfire hazard from excessive biomass accumulation, Undesirable plant productivity and health, Inadequate plant structure and composition, Habitat degradation, Soil erosion, and Excessive sediment in surface waters.

Before Situation:

Tract, field, or farm lacks adequate firebreaks to either reduce the spread of wildfires or contain a prescribed burn. Wide firebreaks are needed due to topography, high wildfire risk or to their use as down-wind breaks for prescribed burns. Conditions such as topography, the presence of brush and trees, etc. make the use of typical farm equipment impractical. As slopes increase, the potential for excessive erosion increases from soil disturbances. Therefore the installation of water control devices such as water bars will be important in protecting the resource base.

After Situation:

The property is adequately protected from wildfire or can be safely prescribe burned and the potential for excessive erosion from the firebreak is minimized.

Feature Measure: Area of Firebreak

Scenario Unit: Acres

Scenario Typical Size: 0.7

Scenario Total Cost: $2,974.03

Scenario Cost/Unit: $4,248.61

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.89	8	$407.12
Fire Plow	1306	Heavy wildland plow or disk used for installing firebreaks. Equipment costs only for plow, use with a dozer component. Labor not included.	Hours	$33.87	4	$135.48
Water Bars	1500	Installation of graded trail water controlling structures such as water bars, broad based dips for erosion control. Typical cross section is 1.5 feet high with 4:1 side slopes yielding about 0.33 CY/ft of length.	Feet	$2.97	425	$1,262.25
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	8	$269.12
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	2	$900.06

Practice: 395 - Stream Habitat Improvement and Management

Scenario: #1 - Riparian Zone Improvement-Forested

Scenario Description:

This scenario describes fish and wildlife habitat improvement and/or management actions focused on the community structure and function of forested riparian zone plant communities. The planned activity meets the 395 standard, and facilitating practice standards, especially Codes 390 and 391, utilized in combination to satisfy all requirements specific to habitats needed for the stream and riparian species for which the practice is being implemented. Implementation will improve instream and riparian habitat complexity, water quality, hiding and resting cover, and/or increased food availability for desired riparian and stream species. Because species and habitats differ dramatically within and across regions and/or MLRAs, up to 12 riparian plant community-specific scenarios may be required across the US.

Before Situation:

Riparian quality and quantity are at risk as determined by the NRCS Stream Visual Assessment Protocol score of less than 5 for those elements. The site does not have adequate food, cover, and/or connectivity for riparian wildlife, and contributes insufficient amounts of organic matter andor large woody material for stream species food and cover. The site's riparian vegetation is compromised by human activities and/or access of vehicles, people, and/or livestock is not controlled adequately to protect riparian functions and stream habitat quality. Nutrients are transported to surface waters through runoff or soil erosion or to ground water from leaching in quantities that degrade water quality and limit use of intended purposes. Soil quality may be reduced due to compaction. Riparian vegetation quality and/or quantity is compromised to the extent that the riparian area and floodplain are not functioning to provide necessary stream and riparian habitat components.

After Situation:

Revegetation/reforestation of the riparian zone is completed and the vegetation community is under close management to insure long-term survival and ecological succession of the plant community. The quality and quantity of the riparian zone components of the site are managed to support a diverse vegetation community suitable for the site, the species that depend on it for habitat, and the functions it performs or will eventually perform as the vegetation matures. These functions include: stream temperature moderation thru shading, recruitment of instream large wood and/or non-woody organic matter, riparian habitat for terrestrial insects and other riparian-dependent species, streambank integrity, and filtration of contaminants from surface run-off into the stream.

Feature Measure: acres

Scenario Unit: Acres

Scenario Typical Size: 2.0

Scenario Total Cost: $15,354.22

Scenario Cost/Unit: $7,677.11

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$29.47	16	$471.52
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.89	8	$407.12
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	160	$5,459.20
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	40	$967.60
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	24	$807.36
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	40	$1,813.60
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	40	$4,448.40
Materials						
Tree, Hardwood, Seedling, Medium	1510	Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only.	Each	$1.52	200	$304.00
Tree shelter, mesh tree tube, 48 in.	1556	48 inch tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only.	Each	$1.02	200	$204.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 395 - Stream Habitat Improvement and Management

Scenario: #2 - Instream wood placement

Scenario Description:

This scenario involves placement of large wood (logs, root wads, log structures) into a stream channel in order to improve aquatic habitat that currently does not meet quality criteria for stream species habitat. A stream assessment (i.e. Stream Visual Assessment Protocol) should be conducted in order to document habitat components lacking for aquatic species (i.e. large wood, pools). A project design for wood placement will be based on assessment of the target stream reach characteristics and those of a suitable reference reach. These characteristics include channel geometry, channel slope, stream bottom substrate size and composition, and the geomorphic setting influencing the channel form, pattern and profile. Large wood and root wads placed into the stream will mimic genus, age, and size of mature trees found in intact, reference riparian areas in the MLRA where the project is located. Large wood/trees with rootwads intact should be placed in streams to create pool habitat according to NRCS engineering specifications and with close review & approval of a fish habitat biologist. Boulders placed to provide ballast shall only be used if the geomorphic setting and project design demand this component. The planned activity will meet the current 395 standard, and facilitating practice standards utilized, including timing of work windows required for protected aquatic and riparian species, and protecting/restoring vegetation and substrates of/to areas impacted by heavy equipment. Implementation will result in the improvement of instream habitat complexity, hiding and resting cover, and/or increased food availability for fish and other stream species. Payment for implementation is to defray the costs of project implementation. Monitoring records demonstrating implementation of this scenario will address resource concerns for stream species of concern are required.

Before Situation:

In this stream reach, habitat for fish, aquatic insects and/or other stream species is sub-optimal as determined by the NRCS Stream Visual Assessment Protocol score of less than 5 overall. The site does not have adequate food, cover, and perhaps habitat connectivity for desired species. Riparian vegetation quality and/or quantity may also be compromised to the extent that the riparian area and floodplain are not functioning to provide necessary stream and riparian habitat components, such as large wood.

After Situation:

Stream habitat within the project reach is improving as a result of placing logs, root wads, and/or wood structures in the channel and/or along the stream bank. Pool habitat in the reach is improved, and hiding cover, food availability and refuge habitat for all stream species is improving.

Feature Measure: Bankfull width x reach length

Scenario Unit: Acres

Scenario Typical Size: 1.0

Scenario Total Cost: $12,378.71

Scenario Cost/Unit: $12,378.71

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hours	$120.60	16	$1,929.60
Truck, dump, 12 CY	1215	Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only.	Hours	$72.63	8	$581.04
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	24	$807.36
Materials						
Boulder	1761	Rock boulders (approximately 5 ft dia. 6.67 Tons) Inlcudes materials and delivery (up to 100 miles) only.	Ton	$66.53	40	$2,661.20
Steel, rebar	1832	Steel rebar, grade 60. Materials only.	Pound	$0.72	50	$36.00
Aggregate, river rock	1834	Well graded, rounded mineral substrates derived from local riverine settings. Includes materials and local delivery	Ton	$24.49	15	$367.35
Log, un-anchored	2035	Price of log picked up at the Mill. Includes material only.	Ton	$163.19	30	$4,895.70
Root Wad	2045	Tree stump buried into the streambank with the roots left exposed. Includes material only.	Ton	$10.02	20	$200.40
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	2	$900.06

Practice: 395 - Stream Habitat Improvement and Management

Scenario: #3 - Instream rock placement

Scenario Description:

This scenario describes the implementation of a stream habitat improvement and management project that places individual boulders or boulder clusters, or rock structures in or adjacent to the stream channel as habitat components. A project design for boulder placement will be based on assessment of the target stream reach characteristics and those of a suitable reference reach. These characteristics include channel geometry, channel slope, stream bottom substrate size and composition, and the geomorphic setting influencing the channel form, pattern and profile. Large rocks/boulders placed in the stream channel will mimic geologic material sizes typically present in the watershed or observed in intact, reference stream reaches in the MLRA where the project is located. Boulders should be placed in streams to create pool habitat and hydraulic complexity according to NRCS engineering specifications and with close review & approval of a fish habitat biologis onsite during implementation of the project design. Spawning gravel placement should be placed to restore spawning area substrates potentially disturbed by rock placement. The planned activity will meet the current 395 standard, and facilitating practice standards utilized. Implementation will result in the improvement of instream habitat complexity, hiding and resting cover, spawning habitat, and/or increased food availability for fish and other stream species. Payment for implementation is to defray the costs of stream habitat assessment, and project implementation. Records demonstrating implementation of this scenario will address resource concerns for stream species of concern will be required.

Before Situation:

In this stream reach, habitat for fish, aquatic insects and other stream species is sub-optimal as determined by the NRCS Stream Visual Assessment Protocol score of less than 5 overall. The site does not have adequate food, cover, and perhaps habitat connectivity for desired species. Riparian vegetation quality and/or quantity may be also compromised to the extent that the riparian area and floodplain are not functioning to provide necessary stream and riparian habitat components, such as large wood, leaf matter, and shade.

After Situation:

Stream habitat within the project reach is improving as a result of placing boulders or constructing rock structures in the channel and/or along the stream bank. Hydraulic complexity of the habitat in the reach is increased, and hiding cover, food availability and refuge habitat for stream species is improving. Streambank vegetation is increasing and contributing to stability of the streambanks.

Feature Measure: Bankfull width x reach length

Scenario Unit: Acres

Scenario Typical Size: 1.0

Scenario Total Cost: $9,086.70

Scenario Cost/Unit: $9,086.70

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hours	$120.60	16	$1,929.60
Truck, dump, 12 CY	1215	Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only.	Hours	$72.63	8	$581.04
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	16	$387.04
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	24	$807.36
Materials						
Boulder	1761	Rock boulders (approximately 5 ft dia. 6.67 Tons) Inlcudes materials and delivery (up to 100 miles) only.	Ton	$66.53	60	$3,991.80
Aggregate, river rock	1834	Well graded, rounded mineral substrates derived from local riverine settings. Includes materials and local delivery	Ton	$24.49	20	$489.80
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	2	$900.06

Practice: 395 - Stream Habitat Improvement and Management

Scenario: #4 - Rock and wood structures

Scenario Description:

This scenario describes the implementation of a stream habitat improvement and management project where practices are focused on instream habitat improvement with a combination of rock AND wood structures. This senario involves placement of large wood and rock structures into a stream channel in order to improve aquatic habitat that currently does not meet quality criteria for stream species habitat. A stream assessment (i.e. Stream Visual Assessment Protocol) should be conducted in order to document habitat components (such as large wood, pools) are not currently present in the stream or are limited for aquatic species. A project design for placement of habitat structures (boulders, boulder clusters, wood, wood structures) will be based on assessment of (a) the target stream reach characteristics and (b) those of a suitable reference reach. These characteristics include channel geometry, channel slope, stream bottom substrate size and composition, and the geomorphic setting influencing the channel form, pattern and profile. Large rocks/boulders placed in the stream channel will mimic geologic material sizes typically present in the watershed or observed in intact, reference stream reaches in the MLRA where the project is located. Rock boulder sizes should also reflect the geomorphic setting of the stream reach. Large wood placed into the stream under this scenario should be similar in species, age, and size (diameter) as trees found in the surrounding riparian area, to the extent possible. Wood, boulders and/or boulder clusters will be placed in the stream to create pool habitat and hydraulic complexity according to NRCS engineering specifications and with close review & approval of a fish habitat biologist onsite during the planning and implementation of the project. This scenario involves restoring one acre of stream. The planned activity will meet the current 395 standard, and facilitating practice standards utilized. Implementation will result in the improvement of instream habitat complexity, hiding and resting cover, and/or increased food availability for fish and other stream species. Payment for implementation is to defray the costs of project implementation. Records demonstrating implementation of this scenario will address resource concerns for stream species of concern will be required.

Before Situation:

In this stream reach, habitat for fish, aquatic insects and/or other stream species is sub-optimal as determined by the NRCS Stream Visual Assessment Protocol score of less than 5. The site does not have adequate food, cover, and perhaps habitat connectivity for desired species. Riparian vegetation quality and/or quantity may also be compromised to the extent that the riparian area and floodplain are not functioning to provide necessary stream habitat components, such as large wood and off-channel refuge habitat.

After Situation:

Stream habitat within the project reach is improving as a result of placing logs, rocks, or constructing wood and rock structures in the channel and/or along the stream bank. Pool habitat in the reach is improved, and hiding cover, food availability and refuge habitat for all stream species is improving.

Feature Measure: stream length X bankfull width

Scenario Unit: Acres

Scenario Typical Size: 1.0

Scenario Total Cost: $26,400.03

Scenario Cost/Unit: $26,400.03

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hours	$120.60	16	$1,929.60
Truck, dump, 12 CY	1215	Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only.	Hours	$72.63	8	$581.04
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	60	$2,047.20
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	24	$580.56
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	24	$807.36
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	180	$8,161.20
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	32	$3,558.72
Materials						
Boulder	1761	Rock boulders (approximately 5 ft dia. 6.67 Tons) Inlcudes materials and delivery (up to 100 miles) only.	Ton	$66.53	40	$2,661.20
Steel, rebar	1832	Steel rebar, grade 60. Materials only.	Pound	$0.72	8	$5.76
Aggregate, river rock	1834	Well graded, rounded mineral substrates derived from local riverine settings. Includes materials and local delivery	Ton	$24.49	7	$171.43

Log, un-anchored	2035	Price of log picked up at the Mill. Includes material only.	Ton	$163.19	30	$4,895.70
Root Wad	2045	Tree stump buried into the streambank with the roots left exposed. Includes material only.	Ton	$10.02	10	$100.20
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	2	$900.06

Practice: 395 - Stream Habitat Improvement and Management

Scenario: #5 - Fish Barrier

Scenario Description:

This scenario describes the implementation of a stream habitat improvement and management project where practices are focused on the stream channel. The planned activity will meet the current 395 standard, and facilitating practice standards utilized. Implementation will result in protecting native aquatic fauna in the reach from competition or harrassament from non-native fish. This action may also increase food availability for fish and other stream species located above the constructed barrier. Payment for implementation is to defray the costs of stream habitat assessment above the barrier, and project implementation. Records demonstrating implementation of this scenario will address resource concerns for aquatic and riparian species of concern will be required.

Before Situation:

In this stream corridor, native aquatic species are at risk as determined by the state fish and wildlife agency. NRCS Stream Visual Assessment Protocol for the reach being protected by a barrier meets quality criteria and provides habitat for native species of concern, as determined by a Stream Visual Assessment Protocol score of greater than 5 .

After Situation:

Native fish inhabiting areas upstream of the newly constructed concrete barrier will not be adversely affected by interactions with non-native species/competitors.

Feature Measure: Each

Scenario Unit: Cubic Yards

Scenario Typical Size: 5.0

Scenario Total Cost: $34,009.74

Scenario Cost/Unit: $6,801.95

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$494.40	60	$29,664.00
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hours	$120.60	10	$1,206.00
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	10	$341.20
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	10	$241.90
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	10	$336.40
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	8	$889.68
Materials						
Steel, rebar	1832	Steel rebar, grade 60. Materials only.	Pound	$0.72	40	$28.80
Plywood, 3/4 inch, untreated	1833	Untreated 4' x 8' sheets of 3/4 inch exterior grade plywood. Includes materials only.	Each	$26.78	15	$401.70
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	2	$900.06

Practice: 396 - Aquatic Organism Passage

Scenario: #1 - Concrete Dam Removal

Scenario Description:

Full or partial removal of a concrete or earthen dam to restore aquatic organism passage, improve water quality, and promote functional river ecology and geomorphology. The extent of removal (full or partial) is determined through consultations with the dam owner in consideration of prevailing regulations and site historical status. Adjacent floodplain surfaces above and below the target dam are considered in the planning process to account for shifts in streamflow and geomorphic regime. Resulting channel dimensions and profile are determined on a site-specific basis to reflect--to the fullest extent possible--pre-dam conditions. Pre-removal sediment assays are completed to determine the toxicity of sediment stored behind the dam. Planning for the reclamation and management of stored sediments is completed according to geomorphic conditions, prevailing regulations, and the results of sediment toxicity investigations. Removal is done with an assortment of equipment, including tracked excavators outfitted with hydraulic chisels, hammers and/or buckets with "thumbs", bull dozers, skid steers, cranes, front-end loaders, and dump trucks. Alternative demolition techniques may include the use of high explosives, diamond-chain, or similar circular saws to remove the dam in a piecewise manner. Removed materials are trucked away and disposed or recycled off-site. Disturbed areas are revegetated with a mix of site-adapted species. Scenario does not include additional measures needed in the active channel and floodplain to account for post-removal changes to stream plan, pattern, or profile, or reclamation of any former impounded areas. Additional structural measures may be necessary to address constructed features associated with the removed dam including canals, raceways, adjacent spillways, navigation locks, access and maintenance roads, or similar civil works. RESOURCE CONCERNS: INADEQUATE HABITAT FOR FISH AND WILDLIFE –Habitat degradation; EXCESS WATER – Ponding, flooding, seasonal high water table, seeps, and drifted snow; WATER QUALITY DEGRADATION – Elevated water temperature. Payments for these associated practices are made separately and are covered by other typical scenarios and payment schedules. See relevant CPS for additional information. ---Site Preparation and Reclamation associated with project footprint: (326) Clearing and Snagging, (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment ---Reach Planning/Habitat Enhancement: (395) Stream Habitat Improvement and Management, ---Structural Measures Associated with Scenario but outside of project footprint: (410) Grade Stabilization Structure, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection, (587) Structure for Water Control

Before Situation:

A channel-spanning concrete dam no longer has functional use, may be failing, or creates a hazard to downstream capital infrastructure or communities. The dam blocks upstream aquatic organism migration, and downstream migrants may be diverted into hydraulic structures that increase mortality or result in migration delays or dead-ends. The dam disrupts the downstream cycling and transport of sediment, woody material and nutrients. The pool created by the dam may impair water quality by increasing temperatures, capturing fine sediment--sometimes laden with heavy metals or other pollutants--later mobilized by high flow events, and creating slackwater habitat for invasive aquatic vegetation. Non-native or exotic fish species inhabit the pool and predate upon and/or displace native fish.

After Situation:

The existing dam is removed and reach geometry and slope are restored to pre-dam conditions to the fullest extent practicable. Aquatic organism passage and river ecology and geomorphic conditions are restored to pre-dam conditions to the fullest extent practicable. Resource Concerns are addressed within the context of the site.

Feature Measure: Cubic Yards of concrete in dam and

Scenario Unit: Cubic Yards

Scenario Typical Size: 250.0

Scenario Total Cost: $34,762.84

Scenario Cost/Unit: $139.05

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Clearing and Grubbing	40	Clearing and Grubbing, includes materials, equipment and labor	Acres	$325.13	1.5	$487.70
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$96.65	20	$1,933.00
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hours	$120.60	60	$7,236.00
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.72	60	$3,043.20
Water management, Flooding & dewatering	969	Includes equipment and power unit. Labor not included.	Acre Feet	$169.04	6	$1,014.24
Truck, dump, 12 CY	1215	Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only.	Hours	$72.63	80	$5,810.40
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	80	$2,729.60
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	60	$1,451.40
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	220	$7,400.80

Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	40	$1,813.60
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	4	$942.84
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	2	$900.06

Practice: 396 - Aquatic Organism Passage

Scenario: #2 - Earthen Dam Removal

Scenario Description:

Full removal of an earthen dam to restore aquatic organism passage, improve water quality, and promote functional river ecology and geomorphology. The removal extent is determined through consultations with the dam owner in consideration of prevailing regulations and site historical status. Adjacent floodplain surfaces above and below the target dam are considered in the planning process to account for shifts in streamflow and geomorphic regime. Resulting channel dimensions and profile are determined on a site-specific basis to reflect, to the fullest extent possible, pre-dam conditions. Pre-removal sediment assays are be completed as necessary to determine the toxicity of sediment stored behind the dam. Planning for the reclamation and management of stored sediments is completed according to geomorphic conditions, prevailing regulations, and the results of sediment toxicity investigations. Removal is done with an assortment of equipment, including tracked excavators outfitted with hydraulic chisels, hammers and/or buckets with "thumbs", bull dozers, skid steers, cranes, front-end loaders, and dump trucks. Removed materials are trucked away and disposed or recycled off-site, unless native streambed material found in the embankment can be used in site reclamation. Disturbed areas are revegetated with a mix of site-adapted species. Scenario does not include additional measures needed in the active channel and floodplain to account for post-removal changes to stream plan, pattern, or profile, or reclamation of any former impounded areas. Additional structural measures may be necessary to address constructed features associated with the removed dam including head gates, canals, raceways, access and maintenance roads, or similar civil works. RESOURCE CONCERNS: INADEQUATE HABITAT FOR FISH AND WILDLIFE –Habitat degradation; EXCESS WATER – Ponding, flooding, seasonal high water table, seeps, and drifted snow; WATER QUALITY DEGRADATION – Elevated water temperature. Payments for these associated practices are made separately and are covered by other typical scenarios and payment schedules. See relevant CPS for additional information. ---Site Preparation and Reclamation associated with project footprint: (326) Clearing and Snagging, (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment ---Reach Planning/Habitat Enhancement: (395) Stream Habitat Improvement and Management, ---Structural Measures Associated with Scenario but outside of project footprint: (410) Grade Stabilization Structure, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection, (587) Structure for Water Control

Before Situation:

A channel-spanning earthen dam no longer has functional use, may be failing, or creates a hazard to downstream capital infrastructure or communities. The dam blocks upstream aquatic organism migration, and downstream migrants may be diverted into hydraulic structures that increase mortality or result in migration delays or dead-ends. The dam disrupts the downstream cycling and transport of sediment, woody material and nutrients. The pool created by the dam may impair water quality by increasing temperatures, capturing fine sediment--sometimes laden with heavy metals or other pollutants--later mobilized by high flow events, and creating slackwater habitat for invasive aquatic vegetation. Non-native or exotic fish species inhabit the pool and predate upon and/or displace native fish.

After Situation:

The existing dam is removed and reach geometry and slope are restored to pre-dam conditions to the fullest extent practicable. Aquatic organism passage and river ecology and geomorphic conditions are restored to pre-dam conditions to the fullest extent practicable. Resource Concerns are addressed within the context of the site.

Feature Measure: Cubic Yards of earthen embankmen

Scenario Unit: Cubic Yards

Scenario Typical Size: 500.0

Scenario Total Cost: $28,310.93

Scenario Cost/Unit: $56.62

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Clearing and Grubbing	40	Clearing and Grubbing, includes materials, equipment and labor	Acres	$325.13	3	$975.39
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$96.65	40	$3,866.00
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hours	$120.60	60	$7,236.00
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.72	60	$3,043.20
Water management, Flooding & dewatering	969	Includes equipment and power unit. Labor not included.	Acre Feet	$169.04	6	$1,014.24
Truck, dump, 12 CY	1215	Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only.	Hours	$72.63	60	$4,357.80
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	40	$1,364.80
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	60	$1,451.40
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	40	$1,345.60
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	40	$1,813.60

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	4	$942.84
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	2	$900.06

Practice: 396 - Aquatic Organism Passage

Scenario: #3 - Blockage Removal

Scenario Description:

Removal of passage barriers, including small relict earthen diversions (e.g., splash dams), failing or undersized culverts, and sediment or large woody material (>10cm diameter and 2m length) from mass wasting or major flood events. Instream material associated with the previously mentioned circumstances or structures prevents aquatic organism passage by the creation of channel-spanning blockages, or areas of shallow depth, high velocities, or extensive changes in water surface elevation. In addition, these features may encourage abrupt channel changes that endanger adjacent capital infrastructure or transportation corridors. Excessive streambank erosion by flows deflected around or impounded behind these features may impair water quality by introducing fine sediment out of phase with the natural hydrograph and the life history requirements of native aquatic species. Removal is done with an assortment of equipment, including tracked excavators outfitted with buckets with "thumbs", bull dozers, skid steers, front-end loaders, and dump trucks. The channel and adjacent floodplain are restored to pre-blockage conditions to the fullest extent practicable. Removed materials are trucked away and disposed or recycled off-site, unless native streambed material found in the blockage can be used in site reclamation. Large woody material, if present, is used for instream reclamation, replaced in the channel downstream of the blockage, or trucked offsite for disposal or stockpiling for future projects. Disturbed areas are revegetated with a mix of site-adapted species. Scenario does not include additional measures needed in the active channel and floodplain. RESOURCE CONCERNS: INADEQUATE HABITAT FOR FISH AND WILDLIFE –Habitat degradation; EXCESS WATER – Ponding, flooding, seasonal high water table, seeps, and drifted snow; WATER QUALITY DEGRADATION – Elevated water temperature; SOIL EROSION– Excessive bank erosion from streams shorelines or water conveyance channels Payments for these associated practices are made separately and are covered by other typical scenarios and payment schedules. See relevant CPS for additional information. ---Site Preparation and Reclamation associated with project footprint: (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment; (643) Restoration and Management of Rare and Declining Habitats. ---Reach Planning/Habitat Enhancement: (395) Stream Habitat Improvement and Management, ---Structural Measures Associated with Scenario but outside of project footprint: (410) Grade Stabilization Structure, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection

Before Situation:

An instream feature spanning the active channel creates hydraulic conditions that exceed the swimming or crawling abilities of native aquatic organisms. Event-driven mass wasting or instream deposits of coarse sediment create channel blockages or areas of shallow, fast-moving water. An instream plug of material transported to the site by flood flows or delivered to the channel from a hillslope failure not only blocks passage, but may deflect the stream toward a new course than endangers adjacent capital infrastructure or transportation corridors. Elevated risks associated with eventual over-topping or failure of the blockage to downstream features or communities are imminent in the event of a blockage that forms a temporary dam. Accelerated instream or lateral channel erosion may introduce fine sediment that impairs water quality.

After Situation:

The instream barrier is removed by a combination of methods and equipment and the channel and affected floodplain are restored to pre-blockage conditions to the fullest extent practicable. Resource Concerns are addressed within the context of the site.

Feature Measure: Cubic Yards of mineral sediment, fil

Scenario Unit: Cubic Yards

Scenario Typical Size: 200.0

Scenario Total Cost: $18,394.60

Scenario Cost/Unit: $91.97

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$29.47	40	$1,178.80
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$96.65	20	$1,933.00
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hours	$120.60	20	$2,412.00
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.72	20	$1,014.40
Water management, Flooding & dewatering	969	Includes equipment and power unit. Labor not included.	Acre Feet	$169.04	2	$338.08
Truck, dump, 12 CY	1215	Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only.	Hours	$72.63	40	$2,905.20
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	20	$682.40
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	140	$4,709.60
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	20	$906.80
Mobilization						

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	6	$1,414.26
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	2	$900.06

Practice: 396 - Aquatic Organism Passage

Scenario: #4 - Nature-Like Fishway

Scenario Description:

Nature-like fishways, also known as roughened channels, rock ramps, or bypass channels, are constructed features that provide passage around an instream barrier or in place of a removed barrier. Fishway design is based on simulating or mimicking adjacent stream characteristics, using natural materials, and providing suitable passage conditions over a range of flows for a wide variety of fish species and other aquatic organisms. Nature-like fishways provide enhanced passage conditions compared to concrete or aluminum (Alaskan Steeppass) ladders, and are not as susceptible to debris-related operational issues. When used to bypass an instream barrier, they require a larger footprint than instream structures, and may also require control structures to regulate flow through the fishway or address tailwater fluctuations affecting the fishway entrance (downstream end). Fishway design includes an assessment of adjacent stream characteristics, including channel geometry, slope, sediment texture and composition, and major geomorphic units that govern channel plan, pattern and profile. In the case of a fishway that bypasses an instream barrier, the design is tailored to these elements, the elevation required to ascend the barrier, and the known range of flow variation or operations. For fishways constructed in the place of a removed barrier, the design may be a hybrid approach that meets the same criteria, although in a smaller instream footprint. Nature-like fishways are constructed with an assortment of equipment used for excavation, placing material, and delivering and removing material. Construction elements generally include an assortment of rock used to create riffles, cascades, or riffle-pool sequences with between 6 to 12 inches of water surface elevation drop between adjacent structures. Large woody material is used to create channel structural elements in some settings, when available and where approved by oversight agencies. Removed materials are trucked away and disposed or recycled off-site, unless excavated native streambed material can be used in fishway construction. Large woody material or removed trees, if present, are used for fishway construction trucked offsite for disposal, or trucked offsite for stockpiling for future projects. Disturbed areas are revegetated with a mix of site-adapted species, and access control and signage are provided. Scenario does not include additional measures needed in the active channel and floodplain or at an existing dam necessary to control flow associated with nature-like fishway. RESOURCE CONCERNS: INADEQUATE HABITAT FOR FISH AND WILDLIFE –Habitat degradation; EXCESS WATER – Ponding, flooding, seasonal high water table, seeps, and drifted snow; WATER QUALITY DEGRADATION – Elevated water temperature; EROSION– Excessive bank erosion from streams shorelines or water conveyance channels Payments for these associated practices are made separately and are covered by other typical scenarios and payment schedules. See relevant CPS for additional information. ---Site Preparation and Reclamation associated with project footprint: (326) Clearing and Snagging, (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment ---Reach Planning/Habitat Enhancement: (395) Stream Habitat Improvement and Management, ---Structural Measures Associated with Scenario but outside of project footprint: (410) Grade Stabilization Structure, (582) Open Channel, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection, (587) Structure for Water Control

Before Situation:

An instream barrier prevents upstream migration of native aquatic organisms and no support exists for removal. Similarly, an instream barrier is removed, and interested parties require maintenance of an upstream pool or pond. The subject stream contains a number of migrating aquatic organisms ranging in size from small to large with a range of propulsion abilities--weak to strong swimmers and animals that crawl along the bottom. In either case--barrier removal or bypassing an existing barrier--local sentiment to preserve existing or natural conditions and the desire to provide passage for a range of aquatic organisms indicate the use of a nature-like fishway. Adequate space for a bypass channel is available, and adjacent landowners approve.

After Situation:

A nature-like fishway is constructed in place of a removed barrier or around an existing barrier. The fishway is designed to mimic the adjacent natural stream, and is constructed of rock and/or large woody material that provides quality passage conditions for a number of species and geomorphic stability over a range of flows. Resource Concerns are addressed within the context of the site.

Feature Measure: Acres of constructed fishway (bankf

Scenario Unit: Acres

Scenario Typical Size: 1.0

Scenario Total Cost: $88,712.47

Scenario Cost/Unit: $88,712.47

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Clearing and Grubbing	40	Clearing and Grubbing, includes materials, equipment and labor	Acres	$325.13	3	$975.39
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.37	12000	$16,440.00
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$5.40	100	$540.00
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$29.47	80	$2,357.60
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hours	$120.60	80	$9,648.00
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.72	100	$5,072.00
Water management, Flooding & dewatering	969	Includes equipment and power unit. Labor not included.	Acre Feet	$169.04	2	$338.08
Truck, dump, 12 CY	1215	Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only.	Hours	$72.63	100	$7,263.00
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	80	$2,729.60

General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	60	$1,451.40
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	280	$9,419.20
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	60	$2,720.40
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	240	$26,690.40
Materials						
Aggregate, river rock	1834	Well graded, rounded mineral substrates derived from local riverine settings. Includes materials and local delivery	Ton	$24.49	50	$1,224.50
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	4	$942.84
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	2	$900.06

Practice: 396 - Aquatic Organism Passage

Scenario: #5 - CMP Culvert

Scenario Description:

A corrugated metal (galvanized steel or aluminum) pipe culvert (CMP) of any shape (round, elliptical, or squash) used at a road-stream crossing to provide aquatic organism passage (AOP) and promote stream ecological and geomorphic function. CMPs used for AOP are sized according to geomorphic analyses, not just an estimate of runoff and streamflow at the site from the contributing watershed. In addition, CMPs used for AOP are filled with a mixture of rock and gravel sized to emulate site stream conditions and geomorphic units in the channel. The simulated streambed material is continuous throughout the culvert barrel, and blended with the intact streambed at the culvert inlet and outlet. The first estimate of culvert size--diameter or span--is obtained by analyzing bankfull channel width on a reach of stream not affected by an existing road crossing or other conditions that alter self-formed conditions. In the case of a culvert replacement, bankfull investigations are begun at least 10-20 estimated bankfull channel widths above the existing stream crossing. Culvert diameter or span is then increased according to channel bed composition and texture, bank characteristics, channel alignment at the crossing section, and other parameters that may affect channel dynamics and stability. Once the CMP diameter or span is determined, culvert length will be determined by roadway geometry and loading requirements, and site stream conditions. Concrete headwalls and/or wingwalls may be necessary in shorter installations and/or where fill/roadway cover is limited or the stream alignment is not perpendicular to the road axis. Culvert wall thickness and corrugations are determined by road loading requirements. Stream geomorphic characteristics, including the reach longitudinal profile, channel cross-sectional shape, substrate composition and arrangement, and bank shape and composition are determined. CMPs are installed with an assortment of equipment used for excavation, placing material, and delivering and removing material. Construction elements generally include an assortment of rock used to create riffles, cascades, or riffle-pool sequences with between 6 to 12 inches of water surface elevation drop between adjacent structures. Stream dewatering and diversion around the work site is often required, and temporary road closure or re-routing may also be required. . Channel bed material within the culvert barrel varies according to prevailing stream characteristics at the crossing site. The culvert is placed within the roadway on a subexcavated compacted bed, set at a slope that matches the design longitudinal profile, and backfilled with a bed mixture that mimics adjacent stream characteristics with special attention to channel pattern. Backfill depths are typically at least 20% of the culvert diameter or rise, but may deviate based on the shape of the culvert used, channel dimensions, substrate size, and the site longitudinal profile. Special equipment such as motorized wheelbarrows may be necessary to backfill smaller CMPs. Once the simulated streambed in the culvert barrel is complete, the roadway is replaced and any necessary armoring and revegetating material is placed at the culvert inlet and outlet where it intersects the road fill prism. Other actions include construction staking and signage, soil erosion and pollution control, removal and disposal of the old culvert, and topsoil conservation for site reclamation. Disturbed areas are revegetated with a mix of site-adapted species. Scenario does not include additional measures needed to address channel incision, bank stability, and other factors associated with the presence of the stream crossing. RESOURCE CONCERNS: INADEQUATE HABITAT FOR FISH AND WILDLIFE –Habitat degradation; EXCESS WATER – Ponding, flooding, seasonal high water table, seeps, and drifted snow; WATER QUALITY DEGRADATION – Elevated water temperature; SOIL EROSION– Excessive bank erosion from streams shorelines or water conveyance channels Payments for these associated practices are made separately and are covered by other typical scenarios and payment schedules. See relevant CPS for additional information. ---Site Preparation and Reclamation associated with project footprint: (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment; ---Reach Planning/Habitat Enhancement: (395) Stream Habitat Improvement and Management, ---Structural Measures Associated with Scenario but outside of project footprint: (410) Grade Stabilization Structure, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection

Before Situation:

An existing undersized culvert as contributed to general bed and bank scour downstream of a road crossing, and may have contributed to the deposition of a wedge of sediment upstream of the road crossing. The road may be overtopped by high flows, resulting in outright failure, landowner accessibility problems, access by and to emergency services, and hamper post-flood recovery efforts. An upstream impoundment created by the undersized culvert has contributed to water quality problems including high water temperatures and the deposition and later mobilization of polluted fine sediment. Native aquatic organisms are unable to pass through the road crossing because the culvert outlet is perched above the downstream pool, and high velocities are not negotiable by animals that are able to leap into the culvert barrel.

After Situation:

The undersized culvert is replaced with a CMP sized, placed, and backfilled with material determined by geomorphic analyses performed in a reference reach upstream of the crossing location. Geomorphic and ecological functions are preserved through the crossing site, enhancing AOP, water quality, and culvert longevity. In addition, because the culvert is sized to promote the transport of streamflow and the materials it carries, it requires decreased maintenance activities over time. Landowners are able to access their holdings across a range of flows, and are able to seek and receive emergency and post-flood recovery services. Resource Concerns are addressed within the context of the site.

Feature Measure: CMP

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $30,063.67

Scenario Cost/Unit: $30,063.67

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.37	900	$1,233.00
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$5.40	50	$270.00
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hours	$120.60	40	$4,824.00
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.72	60	$3,043.20
Water management, Flooding & dewatering	969	Includes equipment and power unit. Labor not included.	Acre Feet	$169.04	1	$169.04
Truck, dump, 12 CY	1215	Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only.	Hours	$72.63	40	$2,905.20
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	40	$1,364.80
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	60	$1,451.40
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	140	$4,709.60
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	40	$1,813.60
Materials						
Aggregate, river rock	1834	Well graded, rounded mineral substrates derived from local riverine settings. Includes materials and local delivery	Ton	$24.49	75	$1,836.75
Pipe, CMP, 96 in., 14 Gauge	1835	96 inch Corrugated Metal Pipe, Galvanized, Uncoated, 14 gage. Material cost only.	Feet	$126.79	40	$5,071.60
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	2	$900.06

Practice: 396 - Aquatic Organism Passage

Scenario: #6 - Bottomless Culvert

Scenario Description:

A multi-plate galvanized steel or aluminum culvert (arch or box) used at a road-stream crossing to provide aquatic organism passage (AOP) and promote stream ecological and geomorphic function. They commonly attach to preformed reinforced or poured-in-place concrete footings. Bottomless culverts used for AOP are sized according to geomorphic analyses, not just an estimate of runoff and streamflow at the site from the contributing watershed. In addition, bottomless culverts used for AOP are filled with a mixture of rock and gravel sized to emulate site stream conditions and geomorphic units in the channel. The simulated streambed material is continuous throughout the culvert barrel, and blended with the intact streambed at the culvert inlet and outlet. The first estimate of culvert span is obtained by analyzing bankfull channel width on a reach of stream not affected by an existing road crossing or other conditions that alter self-formed conditions. In the case of a culvert replacement, bankfull investigations are begun at least 10-20 estimated bankfull channel widths above the existing stream crossing. Culvert span is then increased according to channel bed composition and texture, bank characteristics, channel alignment at the crossing section, and other parameters that may affect channel dynamics and stability. Once the culvert span is determined, culvert length will be dictated by roadway geometry and loading requirements, and site stream conditions. Concrete headwalls and/or wingwalls may be necessary in shorter installations and/or where fill/roadway cover is limited or the stream alignment is not perpendicular to the road axis. Culvert wall thickness and footing requirements are determined by road loading requirements and site geotechnical investigations. Generally, the preferred footing is a T-design with a spread footing with stem wall. Connecting the culvert leg to the footing can be done by welding, grouting, bolting. Stream geomorphic characteristics, including the reach longitudinal profile, channel cross-sectional shape, substrate composition and arrangement, and bank shape and composition are determined. Bottomless arch or box culverts are commonly delivered in sections and bolted together in the field. Smaller arches can be delivered in one piece. They are installed with an assortment of equipment used for excavation, placing material, and delivering and removing material. Construction elements generally include an assortment of rock used to create riffles, cascades, or riffle-pool sequences with between 6 to 12 inches of water surface elevation drop between adjacent structures. Stream dewatering and diversion around the work site is often required, and temporary road closure or re-routing may also be required. Channel bed material within the culvert barrel varies according to prevailing stream characteristics at the crossing site. Footings are placed or poured, and the new streambed is set at a slope that matches the design longitudinal profile, and backfilled with a bed mixture that mimics adjacent stream characteristics with special attention to channel pattern. Once the simulated streambed between the footings is complete, the culvert sections are assembled and attached to the footings. Larger rock may be placed along the footing/culvert stemwall to project the connection from damage by transported bedload. The roadway is replaced and any necessary armoring and revegetating material is placed at the culvert inlet and outlet where it intersects the road fill prism. Other actions include construction staking and signage, soil erosion and pollution control, removal and disposal of the old culvert, and topsoil conservation for site reclamation. Disturbed areas are revegetated with a mix of site-adapted species. Scenario does not include additional measures needed to address channel incision, bank stability, and other factors associated with the presence of the stream crossing. Scenario does not include concrete for head or wingwalls. RESOURCE CONCERNS: INADEQUATE HABITAT FOR FISH AND WILDLIFE –Habitat degradation; EXCESS WATER – Ponding, flooding, seasonal high water table, seeps, and drifted snow; WATER QUALITY DEGRADATION – Elevated water temperature; SOIL EROSION– Excessive bank erosion from streams shorelines or water conveyance channels Payments for these associated practices are made separately and are covered by other typical scenarios and payment schedules. See relevant CPS for additional information. ---Site Preparation and Reclamation associated with project footprint: (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment; ---Reach Planning/Habitat Enhancement: (395) Stream Habitat Improvement and Management, ---Structural Measures Associated with Scenario but outside of project footprint: (410) Grade Stabilization Structure, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection

Before Situation:

An existing undersized culvert as contributed to general bed and bank scour downstream of a road crossing, and may have contributed to the deposition of a wedge of sediment upstream of the road crossing. The road may be overtopped by high flows, resulting in outright failure, landowner accessibility problems, access by and to emergency services, and hamper post-flood recovery efforts. An upstream impoundment created by the undersized culvert has contributed to water quality problems including high water temperatures and the deposition and later mobilization of polluted fine sediment. Native aquatic organisms are unable to pass through the road crossing because the culvert outlet is perched above the downstream pool, and high velocities are not negotiable by animals that are able to leap into the culvert barrel.

After Situation:

The undersized culvert is replaced with a bottomless arch or box culvert sized, placed, and backfilled with material determined by geomorphic analyses performed in a reference reach upstream of the crossing location. Geomorphic and ecological functions are preserved through the crossing site, enhancing AOP, water quality, and culvert longevity. In addition, because the culvert is sized to promote the transport of streamflow and the materials it carries, it requires decreased maintenance activities over time. Landowners are able to access their holdings across a range of flows, and are able to seek and receive emergency and post-flood recovery services. Resource Concerns are addressed within the context of the site.

Feature Measure: Multi-plate arch or box and rock fill

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $46,626.22

Scenario Cost/Unit: $46,626.22

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.37	900	$1,233.00
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$5.40	50	$270.00
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hours	$120.60	40	$4,824.00
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.72	60	$3,043.20
Water management, Flooding & dewatering	969	Includes equipment and power unit. Labor not included.	Acre Feet	$169.04	1	$169.04
Truck, dump, 12 CY	1215	Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only.	Hours	$72.63	40	$2,905.20
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	40	$1,364.80
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	60	$1,451.40
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	140	$4,709.60
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	40	$1,813.60
Materials						
Aggregate, river rock	1834	Well graded, rounded mineral substrates derived from local riverine settings. Includes materials and local delivery	Ton	$24.49	75	$1,836.75
Footing, concrete, precast	1836	Precast spread footing with stemwall, T-shaped, with channel built to accept arched culvert leg. Includes materials only.	Feet	$81.47	80	$6,517.60
Geocell, 6 inch	1842	6-inch thick cellular confinement system, three-dimensional, expandable panels made from high-density polyethylene (HDPE), polyester or another polymer material. Includes materials, labor and equipment for the geocell only, does not include backfill.	Square Yard	$30.23	500	$15,115.00
Culvert, Multi-Plate arch	1979	Multi-plate arch culvert, typically 7 Gauge corrugated plate. Includes metal arch materials only, does not include footings.	Pound	$1.55	1	$1.55
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	2	$900.06

Practice: 396 - Aquatic Organism Passage

Scenario: #7 - Concrete Box Culvert

Scenario Description:

A four-sided precast concrete box (square or rectangular) culvert used at a road-stream crossing to provide aquatic organism passage (AOP) and promote stream ecological and geomorphic function. Concrete box culverts are generally available in sections of 1-foot increments. Concrete box culverts used for AOP are sized according to geomorphic analyses, not just an estimate of runoff and streamflow at the site from the contributing watershed. In addition, concrete box culverts used for AOP are filled with a mixture of rock and gravel sized to emulate site stream conditions and geomorphic units in the channel. The simulated streambed material is continuous throughout the culvert barrel, and blended with the intact streambed at the culvert inlet and outlet. The first estimate of culvert width is obtained by analyzing bankfull channel width on a reach of stream not affected by an existing road crossing or other conditions that alter self-formed conditions. In the case of a culvert replacement, bankfull investigations are begun at least 10-20 estimated bankfull channel widths above the existing stream crossing. Culvert width is then increased according to channel bed composition and texture, bank characteristics, channel alignment at the crossing section, and other parameters that may affect channel dynamics and stability. Once the culvert width is determined, culvert length will be determined by roadway geometry and loading requirements, and site stream conditions. Concrete headwalls and/or wingwalls may be necessary in shorter installations and/or where fill/roadway cover is limited or the stream alignment is not perpendicular to the road axis. Stream geomorphic characteristics, including the reach longitudinal profile, channel cross-sectional shape, substrate composition and arrangement, and bank shape and composition are determined. Concrete box culverts are delivered in sections and assembled onsite, and require adequate bed compaction throughout the crossing section. They are installed with an assortment of equipment used for excavation, placing material, and delivering and removing material. Construction elements generally include an assortment of rock used to create riffles, cascades, or riffle-pool sequences with between 6 to 12 inches of water surface elevation drop between adjacent structures. Stream dewatering and diversion around the work site is often required, and temporary road closure or re-routing may also be required. Channel bed material within the culvert barrel varies according to prevailing stream characteristics at the crossing site. The new streambed is set at a slope that matches the design longitudinal profile, and backfilled with a bed mixture that mimics adjacent stream characteristics with special attention to channel pattern. The roadway is replaced and any necessary armoring and revegetating material is placed at the culvert inlet and outlet where it intersects the road fill prism. Other actions include construction staking and signage, soil erosion and pollution control, removal and disposal of the old culvert, and topsoil conservation for site reclamation. Disturbed areas are revegetated with a mix of site-adapted species. Scenario does not include additional measures needed to address channel incision, bank stability, and other factors associated with the presence of the stream crossing. RESOURCE CONCERNS: INADEQUATE HABITAT FOR FISH AND WILDLIFE –Habitat degradation; EXCESS WATER – Ponding, flooding, seasonal high water table, seeps, and drifted snow; WATER QUALITY DEGRADATION – Elevated water temperature; SOIL EROSION– Excessive bank erosion from streams shorelines or water conveyance channels Payments for these associated practices are made separately and are covered by other typical scenarios and payment schedules. See relevant CPS for additional information. ---Site Preparation and Reclamation associated with project footprint: (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment; ---Reach Planning/Habitat Enhancement: (395) Stream Habitat Improvement and Management, ---Structural Measures Associated with Scenario but outside of project footprint: (410) Grade Stabilization Structure, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection

Before Situation:

An existing undersized culvert as contributed to general bed and bank scour downstream of a road crossing, and may have contributed to the deposition of a wedge of sediment upstream of the road crossing. The road may be overtopped by high flows, resulting in outright failure, landowner accessibility problems, access by and to emergency services, and hamper post-flood recovery efforts. An upstream impoundment created by the undersized culvert has contributed to water quality problems including high water temperatures and the deposition and later mobilization of polluted fine sediment. Native aquatic organisms are unable to pass through the road crossing because the culvert outlet is perched above the downstream pool, and high velocities are not negotiable by animals that are able to leap into the culvert barrel.

After Situation:

The undersized culvert is replaced with a concrete box culvert sized, placed, and backfilled with material determined by geomorphic analyses performed in a reference reach upstream of the crossing location. Geomorphic and ecological functions are preserved through the crossing site, enhancing AOP, water quality, and culvert longevity. In addition, because the culvert is sized to promote the transport of streamflow and the materials it carries, it requires decreased maintenance activities over time. Landowners are able to access their holdings across a range of flows, and are able to seek and receive emergency and post-flood recovery services. Resource Concerns are addressed within the context of the site.

Feature Measure: Concrete box culvert and rock fill

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $54,756.67

Scenario Cost/Unit: $54,756.67

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.37	1000	$1,370.00
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$5.40	75	$405.00
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hours	$120.60	40	$4,824.00
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.72	60	$3,043.20
Water management, Flooding & dewatering	969	Includes equipment and power unit. Labor not included.	Acre Feet	$169.04	1	$169.04
Truck, dump, 12 CY	1215	Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only.	Hours	$72.63	40	$2,905.20
Labor						

Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	40	$1,364.80
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	60	$1,451.40
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	140	$4,709.60
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	40	$1,813.60
Materials						
Aggregate, river rock	1834	Well graded, rounded mineral substrates derived from local riverine settings. Includes materials and local delivery	Ton	$24.49	75	$1,836.75
Culvert, box, 6 ft x 6 ft	1837	Precast concrete box culvert, 6 feet x 6 feet. Typically in 4 foot sections. Includes materials only.	Feet	$359.44	40	$14,377.60
Geocell, 6 inch	1842	6-inch thick cellular confinement system, three-dimensional, expandable panels made from high-density polyethylene (HDPE), polyester or another polymer material. Includes materials, labor and equipment for the geocell only, does not include backfill.	Square Yard	$30.23	500	$15,115.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	2	$900.06

Practice: 396 - Aquatic Organism Passage

Scenario: #8 - Bridge

Scenario Description:

A channel-spanning structure that carries a road or trailway across a river or stream. Constructed of timber, i-beams, or concrete, bridges are attached at either end to prefabricated, reinforced and poured-in-place, or piling abutments capped/surrounded with concrete. Longer span bridges may require instream pilings to support the travel surface. Bridge decking can be timber, concrete, asphalt, or some combination thereof. Typical size 30 ft span bridge, with most single lane bridges being 16 ft width= 480 sq ft Bridge design is completed to conform to loading requirements and site conditions. Geotechnical investigations are used to determine the best support structure suited to a given site. The bridge deck is designed to rest on abutments placed on the adjacent floodplain. Bridge components are delivered to the site and assembled by a combination of equipment and manual labor. They are installed with an assortment of equipment used for excavation, placing material, delivering and removing material, and lifting bridge components from delivery trucks onto the constructed bridge support elements. Other actions include construction staking and signage, soil erosion and pollution control, removal and disposal of the old culvert (if applicable), and topsoil conservation for site reclamation. Stream diversion is not necessary since the bridge will be constructed above the active channel. Disturbed areas are revegetated with a mix of site-adapted species. Scenario does not include additional measures needed to address channel incision, bank stability, and other factors associated with the presence of the bridge crossing. RESOURCE CONCERNS: INADEQUATE HABITAT FOR FISH AND WILDLIFE –Habitat degradation; EXCESS WATER – Ponding, flooding, seasonal high water table, seeps, and drifted snow; WATER QUALITY DEGRADATION – Elevated water temperature; SOIL EROSION– Excessive bank erosion from streams shorelines or water conveyance channels Payments for these associated practices are made separately and are covered by other typical scenarios and payment schedules. See relevant CPS for additional information. ---Site Preparation and Reclamation associated with project footprint: (326) Clearing and Snagging, (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment; ---Reach Planning/Habitat Enhancement: (395) Stream Habitat Improvement and Management, ---Structural Measures Associated with Scenario but outside of project footprint: (410) Grade Stabilization Structure, (582) Open Channel, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection

Before Situation:

An existing stream crossing outfitted with an undersized culvert has a history of maintenance issues and failure. The downstream channel has experienced bed and bank scour, and the crossing may have to the deposition of a wedge of sediment upstream of the road. The road may be overtopped by high flows, resulting in outright failure, landowner accessibility problems, access by and to emergency services, and hamper post-flood recovery efforts. An upstream impoundment created by the undersized culvert has contributed to water quality problems including high water temperatures and the deposition and later mobilization of polluted fine sediment. Native aquatic organisms are unable to pass through the road crossing because the culvert outlet is perched above the downstream pool, and high velocities are not negotiable by animals that are able to leap into the culvert barrel.

After Situation:

The undersized culvert is replaced with a timber bridge placed on precast concrete abutments. The bridge deck is composed of timber planks, and elevated, continuous railings run down each side connecting one abutment to its counterpart on the opposite bank. Signs on either approach indicate bridge capacity and weight restrictions. Because the bridge spans the active channel and sits atop the adjacent floodplain surface, geomorphic and ecological functions are preserved through the crossing site, enhancing AOP, water quality, and culvert longevity. Landowners are able to access their holdings across a range of flows, and are able to seek and receive emergency and post-flood recovery services. Resource Concerns are addressed within the context of the site.

Feature Measure: square feet of bridge deck

Scenario Unit: Square Feet

Scenario Typical Size: 480.0

Scenario Total Cost: $98,038.30

Scenario Cost/Unit: $204.25

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$494.40	100	$49,440.00
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$5.40	50	$270.00
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$29.47	40	$1,178.80
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hours	$120.60	40	$4,824.00
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.72	60	$3,043.20
Truck, Concrete Pump	1211	Concrete pump, normally truck mounted. Use this item in association with other concrete components when job requires placement by other than normal chutes. Include drive and setup time in quantity; therefore, do not include mobilization. Includes equipment and operator.	Hours	$66.60	40	$2,664.00
Truck, dump, 12 CY	1215	Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only.	Hours	$72.63	40	$2,905.20
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	40	$1,364.80

General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	60	$1,451.40
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	180	$6,055.20
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	40	$1,813.60
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	120	$13,345.20
Materials						
Dimension Lumber, Treated	1044	Treated dimension lumber with nominal thickness equal or less than 2". Includes lumber and fasteners	Board Feet	$1.14	1000	$1,140.00
Steel, structural steel members	1779	Structural steel, includes materials and fabrication.	Pound	$1.25	5360	$6,700.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	4	$942.84
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	2	$900.06

Practice: 396 - Aquatic Organism Passage

Scenario: #9 - Concrete Ladder

Scenario Description:

Formed, reinforced, poured-in-place concrete structures outfitted with baffles (Denil), vertical slots, pools and weirs, submerged orifices, chutes or some combination thereof to provide upstream passage for aquatic organisms over dams and other hydraulic structures. Although fish ladder designs vary according to target species and site conditions, they can generally be described as a three-sided concrete channel with integrated hydraulic features that provide a gradual elevation increase across some distance that allows aquatic organism to swim over a barrier--they convert the total barrier head elevation into passable increments. Concrete ladders are often constructed with resting pools and may have switchbacks. The primary water source for a concrete ladder comes from streamflow diverted into the ladder exit (upstream end) and since it is passed through the ladder to the river below, it is not a consumptive use. These ladders often require flow control and regulating devices (sometimes automated), gates, and may need auxiliary pumps to provide attraction flows at the ladder entrance (downstream end) or augment flow in the ladder. Gages above and below the dam are required to inform ladder operation. Trash racks are used at the upstream end to block debris from entering the ladder. Concrete ladders also require frequent maintenance, and flow through unautomated ladders may need to be adjusted manually when adjacent river conditions or dam operations change. Concrete ladder designs can be complex and require interactions between engineering and ecological sciences for successful implementation. For example, the ladder entrance is one of the most important elements of the structure, and placement of this entrance in the downstream reach is a function of site characteristics and aquatic organism biology. In addition, some aquatic animals will not swim through a submerged orifice, so use of pool-orifice ladders is not recommended. Partners associated with dam ownership and operation, regulatory agencies, and others are consulted and included in the design and construction process. Ladder designs account for run volume and timing, and the swimming capabilities of target species. Some ladders in highly visible areas are finished with masonry facades to blend the ladder to the site in the interest of aesthetics or to conform with historic appearances. Concrete ladders are constructed with equipment for excavation, placing material, and delivering and removing material. Lifts or booms are required to place concrete into forms. Because ladders are often attached to existing dams, personnel familiar with the dam structure are involved at all phases of the process to ensure that plans conform with site requirements. Bed and bank excavation are necessary to create the location for concrete ladders, so site isolation and sediment and erosion control measures are used. Disturbed areas are revegetated with a mix of site-adapted species, and access control and signage are provided. Scenario does not include additional measures in the adjacent active channel necessary to control flow, address channel elevation or stability, or encourage fish guidance into the concrete ladder. Scenario does not include structures used as counting stations or to trap and sample upstream migrants. RESOURCE CONCERNS: INADEQUATE HABITAT FOR FISH AND WILDLIFE –Habitat degradation Payments for these associated practices are made separately and are covered by other typical scenarios and payment schedules. See relevant CPS for additional information. ---Site Preparation and Reclamation associated with project footprint: (326) Clearing and Snagging, (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment ---Reach Planning/Habitat Enhancement: (395) Stream Habitat Improvement and Management, ---Structural Measures Associated with Scenario but outside of project footprint: (410) Grade Stabilization Structure, (582) Open Channel, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection, (587) Structure for Water Control

Before Situation:

An operational, low hazard class fixed crest concrete dam becomes the target of parties interested in providing fish passage. The dam presently blocks the upstream migration of a number of native aquatic organisms, and suitable spawning and rearing habitats for targeted fish species exists in upstream river reaches. Assessment of site conditions, dam operation, and target species swimming abilities indicate that a concrete ladder will provide suitable passage conditions during the migration season and pass the expected run volume without excessive delays.

After Situation:

A concrete pool and chute ladder outfitted with aluminum internal features and 2 turn/resting pool is installed. The ladder is attached to the face and abutment of the dam, and the entrance is located along the streambank where migrating aquatic organisms are likely to encounter it. The ladder passes the estimated run volume with minimal delays, and native aquatic animals are able to reach upstream spawning and rearing areas and successfully produce offspring that become part of the population. The ladder has an operating plan that stipulates actions and responsible parties for every month of the year. The ladder is fenced to control access and signage indicating its function and relevant warnings is provided at numerous locations. Resource Concerns are addressed within the context of the site.

Feature Measure: Barrier height (feet)

Scenario Unit: Feet

Scenario Typical Size: 20.0

Scenario Total Cost: $317,494.80

Scenario Cost/Unit: $15,874.74

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$494.40	500	$247,200.00
Clearing and Grubbing	40	Clearing and Grubbing, includes materials, equipment and labor	Acres	$325.13	3	$975.39
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$5.40	100	$540.00
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$29.47	60	$1,768.20
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hours	$120.60	80	$9,648.00
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.72	80	$4,057.60
Water management, Flooding & dewatering	969	Includes equipment and power unit. Labor not included.	Acre Feet	$169.04	6	$1,014.24

Truck, Concrete Pump	1211	Concrete pump, normally truck mounted. Use this item in association with other concrete components when job requires placement by other than normal chutes. Include drive and setup time in quantity; therefore, do not include mobilization. Includes equipment and operator.	Hours	$66.60	60	$3,996.00
Truck, dump, 12 CY	1215	Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only.	Hours	$72.63	60	$4,357.80
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	80	$2,729.60
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	60	$1,451.40
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	220	$7,400.80
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	80	$3,627.20
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	240	$26,690.40
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	3	$195.27
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	4	$942.84
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	2	$900.06

Practice: 396 - Aquatic Organism Passage

Scenario: #12 - Low Water Crossing

Scenario Description:

Structure installed on low volume or on unimproved roads at watercourse crossings. Primary use is to allow livestock and equipment access to other parcels of land or operational units. Low-water crossings provide safe and stable stream crossings that don't negatively impact water and ecological quality while remaining stable across a wide range of flows. Variations exist, but a common application consists of an improved or hardened ford located above a hydraulic control (e.g., bedrock outcropping, riffle, or step composed of coarse substrates). Properly designed and installed low water crossings provide aquatic organism passage (AOP), promote stream ecological and geomorphic function, remain stable over time, and can pass sediment and woody debris. Conservation planning and interaction with the landowner is vital to determine if existing crossings can be consolidated into fewer, more reliable locations. Characterizing a site according to its watershed position and geomorphic function will aid design decisions. Optimal AOP conditions are usually realized when the backfill is composed of a mixture that mimics bed material as evaluated from a reference reach adjacent to the crossing—preferably at least 10-20 estimated bankfull channel widths above an existing crossing to avoid effects that alter channel geometry or bedform composition and spacing. Low water crossings are installed with an assortment of equipment used for excavation, placing material, and delivering and removing material. Low water crossings provide the best mix of function and longevity when they are designed and built to conform to existing channel geometry and slope, constructed to match the shape of the existing channel, and oriented to cross the stream at a 90 degree angle. Crossing width, measured along the downstream axis, should not exceed 2X bankfull width. Low water crossings are commonly constructed by overexcavating the crossing section 6-12 inches below the existing streambed and backfilling the void with well-graded rock back to natural bed elevation. Geotextile lining may be required in some settings. Rock size and gradation is the smallest mix needed to remain stable under prevailing flow conditions—larger rock can endanger livestock and turbulence impairs passage. Sand or soil may be added into the mix to seal the section to ensure that the stream doesn't percolate into the crossing substrate. Smaller material increases bed diversity, chokes voids between bigger stones, and helps preserve passage quality. Smaller rock smaller (< 2 inches) at the finished surface may become lodged in livestock hooves. The road/trail surface of the crossing should be extended to an elevation that exceeds the known high water level on each side of the crossing. The downstream edge of the crossing should not produce a sharp drop in water surface to preserve AOP quality and discourage sediment deposition and debris accumulation. Other actions include construction staking and signage, soil erosion and pollution control, removal and disposal of the old culvert, and topsoil conservation for site reclamation. Disturbed areas are revegetated with a mix of site-adapted species. Scenario does not include additional measures needed to address channel incision, bank stability, and other factors associated with the presence of the stream crossing. Stream corridor fencing should be considered to control livestock access and preserve water and riparian quality. RESOURCE CONCERNS: INADEQUATE HABITAT FOR FISH AND WILDLIFE –Habitat degradation Payments for these associated practices are made separately and are covered by other typical scenarios and payment schedules. See relevant CPS for additional information. ---Site Preparation and Reclamation associated with project footprint: (326) Clearing and Snagging, (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment ---Reach Planning/Habitat Enhancement: (395) Stream Habitat Improvement and Management, ---Structural Measures Associated with Scenario but outside of project footprint: (410) Grade Stabilization Structure, (582) Open Channel, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection, (587) Structure for Water Control

Before Situation:

A small farming operation has a mixture of pastures, hay meadows, and crops that all require seasonal movement of equipment and livestock between parcels. Four unimproved stream crossings provide unreliable access across the property and require yearly maintenance to clear debris and sediment. Farm equipment has gotten stuck in the past, and uncontrolled livestock access and frequent crossing or loafing in the stream contributes to chronic water quality problems associated with elevated fine sediment, high water temperatures, invasive aquatic vegetation, and fecal coliform bacteria. Livestock avoid three of the crossings when streamflow increases moderately. Two of the crossings are overwide and shallow, and impair AOP. The property and landowner's yearly operations are reviewed by conservation planners and—with the input and agreement of the landowner—it is decided that three of the four crossings can be eliminated and consolidated at one site above a cobble/boulder deposit in the stream.

After Situation:

An improved ford is constructed by excavating the channel just upstream of the boulder/cobble hydraulic control. The cut is lined with geotextile to control seepage and subsurface flow, and backfilled up to the existing bed elevation with a well-graded mix of rock sized to mimic the material in the channel upstream of the crossing. The finished crossing surface is at grade with the up and downstream channel elevation, and no drop exists along the downstream edge. Approaches on either side of the crossing are extended up to the adjacent floodplain surface, and the finished instream portion of the ford matches the existing channel cross section. Approach slopes are shallow enough for expected equipment traffic, including towed combinations, and armored as needed with larger rock to protect against erosion that may occur when the floodplain is inundated. The crossing is fenced and gated to control livestock access and provide greater flexibility to the landowner's grazing needs. AOP is provided, and the crossing remains stable across a range of flow and sediment and debris transport events. Resource Concerns are addressed within the context of the site.

Feature Measure: Cubic Yard

Scenario Unit: Cubic Yards

Scenario Typical Size: 60.0

Scenario Total Cost: $36,097.22

Scenario Cost/Unit: $601.62

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Clearing and Grubbing	40	Clearing and Grubbing, includes materials, equipment and labor	Acres	$325.13	0.5	$162.57
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.37	1000	$1,370.00
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$5.40	50	$270.00
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$29.47	80	$2,357.60
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hours	$120.60	60	$7,236.00
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.72	80	$4,057.60
Truck, dump, 12 CY	1215	Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only.	Hours	$72.63	40	$2,905.20
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	60	$2,047.20
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	60	$1,451.40
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	260	$8,746.40
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	40	$1,813.60
Materials						
Aggregate, river rock	1834	Well graded, rounded mineral substrates derived from local riverine settings. Includes materials and local delivery	Ton	$24.49	75	$1,836.75
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	4	$942.84
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	2	$900.06

Practice: 396 - Aquatic Organism Passage

Scenario: #13 - Paddlewheel Screen

Scenario Description:

A fish screen used at surface (gravity) diversions intended to prevent juvenile or small-bodied adult fish from entering ditches, canals, laterals or other pathways that lead to migration dead-ends or sources of mortality. Paddlewheel screens are active by design, meaning that they are outfitted with mechanisms that automatically cycle to keep the screen free of debris that will restrict the screen area, impede flow through the screen, and may cause the screen to fail. These screens are powered by a paddlewheel driven by flowing water and are thus suitable for remote locations without electrical services. Paddlewheel screens can be installed in the active channel along a streambank, but are most commonly built in a canal below a diversion structure. Aquatic organisms that encounter a screen installed in a canal are diverted back into the adjacent stream through a buried pipe. Screens installed in the active channel are built at the point of diversion with the screen face aligned parallel to the flow of the river. Bankline modifications can be necessary to achieve proper alignment. Screens installed in a canal can be aligned differently and are best sited at a canal location that minimizes the straight-line bypass/return path distance. Again, canal installation is the most common. A fully functional screen is designed to meet criteria intended to protect target organisms from being swept into and pinned against or along the screen face (impingement). When this occurs, animals can be physically harmed or, in the case of a rotating drum screen, introduced into the diversion works behind the screen. Active screens are designed to ensure that the approach velocity will not exceed .4 feet per second (fps). Approach velocity is calculating by dividing the maximum screened flow volume by the vertical projection of the effective screen area at maximum submergence. For a rotating drum screen the design submergence should not be more than 85% or less than 65% of the screen diameter. Screen design should strive to provide nearly uniform flow distribution across the screen surface. Screens longer than 6 feet must be angled to the direction of incoming flow and have sweeping velocities (along the face of the screen) greater than the approach velocity, and sweeping velocities should not decrease along the face of the screen. Screen face openings must not exceed 3/32 inch in diameter, and perforated plate must be smooth to the touch with openings punched through in the direction of approaching flow. Material used for the screen face should be corrosion resistant and sufficiently durable to maintain a smooth uniform surface with long term use. Bypass design flow should be about 5% of the diverted amount, include an easily accessible entrance, and flow velocity in the bypass pipe or channel should not exceed 0.2fps. Minimum design depth in a bypass pipe should be at least 40% of the pipe diameter. Bypass entrances should be installed with independent flow control capability. The face of all screen surfaces must be placed flush (to the extent possible) with any adjacent screen bay, pier noses, and walls to allow fish unimpeded movement parallel to the screen face and ready access to bypass routes. Paddlewheel screens are generally fabricated at a machine shop and delivered to the project site. Site conditions may require the construction of a small concrete headwall that will anchor the screen and may be outfitted with flow control that to adjust hydraulic conditions and optimize screen function. In addition, concrete training walls to conduct flow into, through, and below the screen may be required at some sites. Paddlewheel screens are installed with an assortment of equipment used for excavation, placing material, and delivering and removing material. A crane or boom truck may be needed to place the screen assembly. Other actions include construction staking and signage, soil erosion and pollution control, access control and fencing, and topsoil conservation for site reclamation. Disturbed areas are revegetated with a mix of site-adapted species. Scenario does not include additional measures needed to address channel incision, bank stability, or factors associated with channel improvements at the bypass pipe outfall. Final contracts stipulate entities and schedules for operation and maintenance. RESOURCE CONCERNS: INADEQUATE HABITAT FOR FISH AND WILDLIFE –Habitat degradation Payments for these associated practices are made separately and are covered by other typical scenarios and payment schedules. See relevant CPS for additional information. ---Site Preparation and Reclamation associated with project footprint: (326) Clearing and Snagging, (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment ---Reach Planning/Habitat Enhancement: (395) Stream Habitat Improvement and Management, ---Structural Measures Associated with Scenario but outside of project footprint: (410) Grade Stabilization Structure, (582) Open Channel, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection, (587) Structure for Water Control

Before Situation:

An unscreened gravity diversion removes water and fish from a small stream. The ditch under the 5 cfs diversion serves a number of pumps and turnouts used to irrigate alfalfa and flood irrigate hay. The diversion is run from late winter into fall, although the flood irrigated crops are shut off in mid-summer to allow growth and prepare the fields for mowing and haying. Although the diversion is owned by a nth-generation landowner with proven, long-standing rights to the diverted water, recent fish listings under the Endangered Species Act present liability risks in the face of a third party lawsuit. Diverted listed fish are killed in residual depressions in the irrigated meadow, and often become entrained and killed in pumps used to drive wheel lines used to irrigate alfalfa.

After Situation:

A modular rotating drum paddlewheel screen is installed in the ditch about 100 feet downstream of the diversion dam. The screen is outfitted with a screw-gated 10-inch smooth HDPE pipe buried below the floodplain that connects the bypass entrance to a deep pool in the adjacent stream. The screen is placed on an excavated bed backfilled with compacted sand and gravel, and bolted to a small reinforced poured-in-place concrete headwall. Inspection during the first operational season following construction confirms that the screen is within hydraulic criteria and providing adequate protection to listed fish. The screen structure is fenced from livestock, and inspected and maintained according to contractual agreements. Resource Concerns are addressed within the context of the site.

Feature Measure: CFS

Scenario Unit: Cubic Feet per Second

Scenario Typical Size: 5.0

Scenario Total Cost: $44,886.57

Scenario Cost/Unit: $8,977.31

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$494.40	15	$7,416.00
Clearing and Grubbing	40	Clearing and Grubbing, includes materials, equipment and labor	Acres	$325.13	1	$325.13
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$5.40	20	$108.00
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hours	$120.60	40	$4,824.00
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.72	40	$2,028.80
Truck, Concrete Pump	1211	Concrete pump, normally truck mounted. Use this item in association with other concrete components when job requires placement by other than normal chutes. Include drive and setup time in quantity; therefore, do not include mobilization. Includes equipment and operator.	Hours	$66.60	32	$2,131.20
Truck, dump, 12 CY	1215	Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only.	Hours	$72.63	32	$2,324.16
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	60	$2,047.20
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	60	$1,451.40
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	110	$3,700.40
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	40	$1,813.60
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	120	$13,345.20
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	2000	$2,000.00
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	2	$900.06

Practice: 396 - Aquatic Organism Passage

Scenario: #14 - Rotating Drum Screen

Scenario Description:

A fish screen used at surface (gravity) diversions intended to prevent juvenile or small-bodied adult fish from entering ditches, canals, laterals or other pathways that lead to migration dead-ends or sources of mortality. Rotating drum screens are active by design, meaning that they are outfitted with mechanisms that automatically cycle to keep the screen free of debris that will restrict the screen area, impede flow through the screen, and may cause the screen to fail. These screens are powered electric motors that rotate a drum covered in fine stainless steel mesh. The drum rotates in the direction of the incoming flow, and is designed to protect fish from entrainment into the diversion while at the same time rolling fine debris attached to the screen face into the ditch or canal below. Rotating drum screens can be installed in the active channel along a streambank, but are most commonly built in a canal below a diversion structure. . Aquatic organisms that encounter a screen installed in a canal are diverted back into the adjacent stream through a buried pipe. Screens installed in the active channel are built at the point of diversion with the screen face aligned parallel to the flow of the river. Bankline modifications can be necessary to achieve proper alignment. Screens installed in a canal can be aligned differently and are best sited at a canal location that minimizes the straight-line bypass/return path distance. Again, canal installation is the most common. A fully functional screen is designed to meet criteria intended to protect target organisms from being swept into and pinned against or along the screen face (impingement). When this occurs, animals can be physically harmed or, in the case of a rotating drum screen, introduced into the diversion works behind the screen. Active screens are designed to ensure that the approach velocity will not exceed .4 feet per second (fps). Approach velocity is calculating by dividing the maximum screened flow volume by the vertical projection of the effective screen area at maximum submergence. For a rotating drum screen the design submergence should not be more than 85% or less than 65% of the screen diameter. Screen design should strive to provide nearly uniform flow distribution across the screen surface. Screens longer than 6 feet must be angled to the direction of incoming flow and have sweeping velocities (along the face of the screen) greater than the approach velocity, and sweeping velocities should not decrease along the face of the screen. Screen face openings must not exceed 3/32 inch in diameter, and perforated plate must be smooth to the touch with openings punched through in the direction of approaching flow. Material used for the screen face should be corrosion resistant and sufficiently durable to maintain a smooth uniform surface with long term use. Bypass design flow should be about 5% of the diverted amount, include an easily accessible entrance, and flow velocity in the bypass pipe or channel should not exceed 0.2fps. Minimum design depth in a bypass pipe should be at least 40% of the pipe diameter. Bypass entrances should be installed with independent flow control capability. The face of all screen surfaces must be placed flush (to the extent possible) with any adjacent screen bay, pier noses, and walls to allow fish unimpeded movement parallel to the screen face and ready access to bypass routes. Rotating drum screens are composed of elements fabricated at a machine shop and delivered to the project site, or built onsite. They are generally part of a reinforced, poured-in-place mass of concrete that forms a three-sided section above, around, and below the screen. Onsite derricks or metal framework can be required above screen bays to facilitate lifting drums for maintenance and inspection of side and bottom seals. Rotating drum screens may need to be fitted with flow control devices that to adjust hydraulic conditions and optimize screen function. Rotating drum screens are installed with an assortment of equipment used for excavation, placing material, and delivering and removing material. A crane or boom truck may be needed to place elements of larger screen installations, including gates, drums, and overhead metal framework. Other actions include construction staking and signage, soil erosion and pollution control, access control and fencing, and topsoil conservation for site reclamation. Disturbed areas are revegetated with a mix of site-adapted species. Scenario does not include additional measures needed to address channel incision, bank stability, or factors associated with channel improvements at the bypass pipe outfall. RESOURCE CONCERNS: INADEQUATE HABITAT FOR FISH AND WILDLIFE –Habitat degradation Payments for these associated practices are made separately and are covered by other typical scenarios and payment schedules. See relevant CPS for additional information. ---Site Preparation and Reclamation associated with project footprint: (326) Clearing and Snagging, (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment ---Reach Planning/Habitat Enhancement: (395) Stream Habitat Improvement and Management, ---Structural Measures Associated with Scenario but outside of project footprint: (410) Grade Stabilization Structure, (582) Open Channel, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection, (587) Structure for Water Control

Before Situation:

An unscreened gravity diversion removes water and fish from a medium-sized stream. The ditch under the 75 cfs diversion serves a number of pumps and turnouts used to irrigate alfalfa and flood irrigate hay. The diversion is run from late winter into fall, although the flood irrigated crops are shut off in mid-summer to allow growth and prepare the fields for mowing and haying. Although the diversion is owned by a nth-generation landowner with proven, long-standing rights to the diverted water, recent fish listings under the Endangered Species Act present liability risks in the face of a third party lawsuit. Diverted listed fish are killed in residual depressions in the irrigated meadow, and often become entrained and killed in pumps used to drive wheel lines used to irrigate alfalfa.

After Situation:

A rotating drum screen consisting of three 8-foot wide, 4-foot diameter drums each driven by a 5hp electric motor is installed in the ditch about 200 feet downstream of the diversion dam. The screen is outfitted with a screw-gated 20-inch smooth HDPE pipe buried below the floodplain that connects the bypass entrance to a deep pool in the adjacent stream. The screen is placed in a concrete section extending above, underneath and below the drum location that forms the structure holding the drums, side and bottom seals, bypass entrance, and screen fore and afterbay. A steel I-beam structure is erected to form continuous overhead cover above the screen bays, and outfitted with a traveling electric winch used to raise each drum for periodic maintenance and seal inspection. Inspection during the first operational season following construction confirms that the screen is within hydraulic criteria and providing adequate protection to listed fish. The screen structure is fenced from livestock, and inspected and maintained according to contractual agreements. Resource Concerns are addressed within the context of the site.

Feature Measure: CFS

Scenario Unit: Cubic Feet per Second

Scenario Typical Size: 75.0

Scenario Total Cost: $87,979.37

Scenario Cost/Unit: $1,173.06

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$494.40	100	$49,440.00
Clearing and Grubbing	40	Clearing and Grubbing, includes materials, equipment and labor	Acres	$325.13	1	$325.13
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$5.40	50	$270.00
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hours	$120.60	40	$4,824.00
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.72	40	$2,028.80
Truck, Concrete Pump	1211	Concrete pump, normally truck mounted. Use this item in association with other concrete components when job requires placement by other than normal chutes. Include drive and setup time in quantity; therefore, do not include mobilization. Includes equipment and operator.	Hours	$66.60	32	$2,131.20
Truck, dump, 12 CY	1215	Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only.	Hours	$72.63	32	$2,324.16
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	60	$2,047.20
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	60	$1,451.40
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	110	$3,700.40
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	60	$2,720.40
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	120	$13,345.20
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	2000	$2,000.00
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	2	$900.06

Practice: 402 - Dam

Scenario: #1 - pipe principal spillway

Scenario Description:

This scenario is the construction of an earthen embankment to impound water. A corrugated metal pipe (CMP) principal spillway will be constructed. A metal trash guard protects the spillway inlet. A circular CMP riser connects to a CMP barrel that runs through the dam to outlet safely downstream. A sand diaphram is installed in the embankment. This scenario assists in addressing the resource concerns: excessive runoff, flooding or ponding, inefficient water use on irrigated land, reduced capacity of conveyances by sediment deposition.

Before Situation:

Area exists where water could naturally pool or run off to create a pond for livestock, wildlife, fire control, flood control, or irrigation. The site meets satisfactory conditions according to the standard.

After Situation:

The typical dam is constructed by excavation and compaction to create an embankment. The principal spillway is completed by using a CMP riser with a metal trash gaurd and a CMP barrel. A sand diaphragm is installed. Vegetation will be completed under Critical Area Planting (342) standard. . Other associated practices such as; Fence (382), Pipeline (516), Pumping Plant (533), Watering Facility (614), Structure For Water Control (587), and Aquatic Organism Passage (396) will use the corresponding Standard(s) as appropriate.

Feature Measure: Embankment Volume

Scenario Unit: Cubic Yards

Scenario Typical Size: 25,000.0

Scenario Total Cost: $167,020.69

Scenario Cost/Unit: $6.68

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$494.40	1	$494.40
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	25000	$52,000.00
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	25000	$104,750.00
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$5.40	90	$486.00
Trenching, Earth, 12 in. x 48 in.	53	Trenching, earth, 12 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling	Feet	$1.24	130	$161.20
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	20	$682.40
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	20	$483.80
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	40	$1,813.60
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic Yards	$28.74	52	$1,494.48
Pipe, PVC, 2 in., SCH 40	976	Materials: - 2 inch - PVC - SCH 40 - ASTM D1785	Feet	$1.27	90	$114.30
Trash Guard, metal	1608	Trash Guard, fabricated-steel, includes materials, equipment, and labor to transport and place Conical shaped trash guard for drop inlet spillway. Typically fabricated of CMP and steel. Includes materials, equipment, and labor to fabricate and transport.	Pound	$2.63	60	$157.80
Pipe, CMP, 30 in., 16 Gauge	1742	30 inch Corrugated Metal Pipe, Galvanized, Uncoated, 16 gage. Material cost only.	Feet	$33.08	35	$1,157.80
Pipe, CMP, 18 in., 16 Gauge	1743	18 inch Corrugated Metal Pipe, Galvanized, Uncoated, 16 gage. Material cost only.	Feet	$20.68	130	$2,688.40
Mobilization						

Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	1	$65.09
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 410 - Grade Stabilization Structure

Scenario: #1 - Check Dams

Scenario Description:

Typical setting is on a 40-acre pasture/hayland field having a slope of 5 to 10 percent where ephemeral gullies have formed. Typical installation consists of stabilizing/regrading the gully and installing six check dams with a top width of 3', average height of 2.5', 19' length, and 2:1 side slopes, ; containing an average of 21 tons of rock for a total of 126 tons. The check dams are underlain with geotextile fabric. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as water quality degradation and soil erosion-concentrated flow erosion.

Before Situation:

The operator presently has erosion gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

After Situation:

Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed vegetation of disturbed areas use Critical Area Planting (342).

Feature Measure: Tons of rock installed

Scenario Unit: Ton

Scenario Typical Size: 126.0

Scenario Total Cost: $7,994.22

Scenario Cost/Unit: $63.45

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, common earth, large equipment, 50 ft	1222	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yards	$1.54	160	$246.40
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	8	$193.52
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic Yards	$84.32	84	$7,082.88
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 410 - Grade Stabilization Structure

Scenario: #2 - Embankment, Pipe <= 6 inch

Scenario Description:

An earthen embankment dam with a principal spillway pipe of 6 inches or less. Assessment shows anti-seep collars or sand diaphragms are not required. To stabilized the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a typical amount of earthfill of 2,000 cubic yards, and 80 feet of pipe 6" PVC pipe with a canopy inlet. A small, non-lined plunge pool protects the outlet channel. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Before Situation:

The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

After Situation:

Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Pumping Plant (533), Watering Facility (614), and Livestock Pipeline (516) will use the corresponding Standard(s) as appropriate.

Feature Measure: Cubic Yards of Earthfill

Scenario Unit: Cubic Yards

Scenario Typical Size: 2,000.0

Scenario Total Cost: $11,082.47

Scenario Cost/Unit: $5.54

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	2000	$8,380.00
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$5.40	20	$108.00
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$100.83	5	$504.15
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	20	$682.40
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	10	$241.90
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	5	$168.20
Materials						
Pipe, PVC, 6 in., SCH 40	980	Materials: - 6 inch - PVC - SCH 40 - ASTM D1785	Feet	$6.58	80	$526.40
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 410 - Grade Stabilization Structure

Scenario: #3 - Embankment, Pipe 8-12 inch

Scenario Description:

An earthen embankment dam with a principle spillway pipe between 8 and 12 inches, anti-seep collars or sand diaphragm, and excavated plunge pool basin. Installed to stabilized the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a typical amount of earthfill of 2,500 cubic yards, 90 feet of 10" pace, pipe with a canopy inlet, and 3 cubic yard sand diaphragm. A non-lined plunge pool protects the outlet channel. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Before Situation:

The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

After Situation:

Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Pumping Plant (533), Watering Facility (614), and Livestock Pipeline (516) will use the corresponding Standard(s) as appropriate.

Feature Measure: Cubic Yards of Earthfill

Scenario Unit: Cubic Yards

Scenario Typical Size: 2,500.0

Scenario Total Cost: $16,859.03

Scenario Cost/Unit: $6.74

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	2500	$10,475.00
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$5.40	29	$156.60
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$100.83	10	$1,008.30
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	30	$1,023.60
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	30	$725.70
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	10	$336.40
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic Yards	$28.74	3	$86.22
Pipe, PVC, 2 in., SCH 40	976	Materials: - 2 inch - PVC - SCH 40 - ASTM D1785	Feet	$1.27	60	$76.20
Pipe, PVC, 10 in., SCH 80	1351	Materials: - 10 inch - PVC - SCH 80 - ASTM D1785	Feet	$27.05	90	$2,434.50
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	1	$65.09
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 410 - Grade Stabilization Structure

Scenario: #4 - Embankment, Pipe >12 inch

Scenario Description:

An earthen embankment dam with a principle spillway pipe greater than 12 inches. Installed to stabilized the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a typical amount of earthfill of 2,500 cubic yards, smooth steel drop inlet principle spillway with a 7 ft riser and 90 ft barrel, and 82 Square feet of anti-seep collars. A rock lined plunge pool protects the outlet channel. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Before Situation:

The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

After Situation:

Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Pumping Plant (533), Watering Facility (614), and Livestock Pipeline (516) will use the corresponding Standard(s) as appropriate.

Feature Measure: Cubic Yards of Earthfill

Scenario Unit: Cubic Yards

Scenario Typical Size: 2,500.0

Scenario Total Cost: $21,059.51

Scenario Cost/Unit: $8.42

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formless, non reinforced	36	Non reinforced concrete cast-in-placed without forms by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$184.90	1	$184.90
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$494.40	2	$988.80
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	2500	$10,475.00
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$5.40	129	$696.60
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$100.83	13	$1,310.79
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	38	$1,296.56
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	42	$1,015.98
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	13	$437.32
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic Yards	$84.32	14	$1,180.48
Dimension Lumber, Treated	1044	Treated dimension lumber with nominal thickness equal or less than 2". Includes lumber and fasteners	Board Feet	$1.14	30	$34.20
Steel, Plate, 1/8 in.	1047	Flat Steel Plate, 1/8 inch thick, materials only.	Square Feet	$4.01	82	$328.82
Pipe, Steel, 12 in., Std Wt, USED	1356	Materials: - USED - 12 inch - Steel Std Wt	Feet	$25.20	90	$2,268.00
Pipe, Steel, 16 in., Std Wt, USED	1357	Materials: - USED - 16 inch - Steel Std Wt	Feet	$43.65	7	$305.55
Mobilization						

Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	1	$65.09
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 410 - Grade Stabilization Structure

Scenario: #5 - Embankment, Soil Treatment

Scenario Description:

An earthen embankment dam with a principal spillway pipe where on site soils are not acceptable and require extra processing or hauling from off farm, distances greater than one mile. Installed to stabilized the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a typical amount of earthfill of 2,500 cubic yards, 90 feet of 10" pace, pipe with a canopy inlet, and 3 cubic yard sand diaphragm. A non-lined plunge pool protects the outlet channel. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Before Situation:

The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

After Situation:

Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Pumping Plant (533), Watering Facility (614), and Livestock Pipeline (516) will use the corresponding Standard(s) as appropriate.

Feature Measure: Cubic Yards of Earthfill

Scenario Unit: Cubic Yards

Scenario Typical Size: 2,500.0

Scenario Total Cost: $23,859.03

Scenario Cost/Unit: $9.54

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	2500	$10,475.00
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$5.40	29	$156.60
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$100.83	10	$1,008.30
Hauling, bulk, highway truck	1615	Hauling of bulk earthfill, rockfill, waste or debris. One-way travel distance using fully loaded highway dump trucks (typically 16 CY or 20 TN capacity). Includes equipment and labor for truck only. Does not include cost for loading truck.	Cubic Yard Mile	$0.28	25000	$7,000.00
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	30	$1,023.60
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	30	$725.70
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	10	$336.40
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic Yards	$28.74	3	$86.22
Pipe, PVC, 2 in., SCH 40	976	Materials: - 2 inch - PVC - SCH 40 - ASTM D1785	Feet	$1.27	60	$76.20
Pipe, PVC, 10 in., SCH 80	1351	Materials: - 10 inch - PVC - SCH 80 - ASTM D1785	Feet	$27.05	90	$2,434.50
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	1	$65.09
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 410 - Grade Stabilization Structure

Scenario: #6 - Pipe Drop, Plastic

Scenario Description:

A full flow pipe drop (ie: riser and barrel) grade stabilization structure designed and constructed using plastic pipe without anti-seep collars. This is typically a earthen dry dam structure with no permanent storage (water or sediment), however some structures may have some permanent pool / storage but do not have 35 years of sediment life. Payment rate is based upon the riser volume (length times area) in cubic feet plus the barrle volume (length times area) in cubic feet. Installed to stabilized the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon 6 ft high 18" dia PVC riser with a 40 ft long barrel. (18" diameter x 6 ft length) + (18" diameter x 40ft. length) = 828 Diameter-inch feet. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Before Situation:

The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

After Situation:

Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Channel Bed Stabilization (584), Dike (356), Grassed Waterway (412), Structure for Water Control (587), and Irrigation Canal or Lateral (320) will use the corresponding Standard(s) as appropriate.

Feature Measure: (Riser Length x diameter in inches)

Scenario Unit: Diameter Inch Foot

Scenario Typical Size: 828.0

Scenario Total Cost: $5,926.50

Scenario Cost/Unit: $7.16

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$494.40	1	$494.40
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	100	$419.00
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$5.40	20	$108.00
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$100.83	2	$201.66
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	8	$193.52
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	2	$67.28
Materials						
Pipe, PVC, 18 in., SCH 40	1373	Materials: - 18 inch - PVC - SCH 40 - ASTM D1785	Feet	$36.32	40	$1,452.80
Coupling, PVC, Tee, 24x18, SCH 40	1374	Materials: - Tee, 24 x 18 inch - PVC - SCH 40 - ASTM D1785	Each	$2,433.50	1	$2,433.50
Pipe, PVC, 24 in., ASTM-2241, SDR 26	1945	Materials: - 24 inch -PVC - ASTM 2241, SDR 26	Feet	$42.59	6	$255.54
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	1	$65.09
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 410 - Grade Stabilization Structure

Scenario: #7 - Pipe Drop, Steel

Scenario Description:

A full flow pipe drop (ie: riser and barrel) grade stabilization structure designed and constructed with a metal anti-seep collar. This is typically a earthen dry dam structure with no permanent storage (water or sediment), however some structures may have some permanent pool / storage but do not have 35 years of sediment life. Payment rate is based upon the riser weir length (Diameter x 3.14) in feet times the length of the pipe barrel in (feet). Installed to stabilized the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a smooth steel pipe drop structure with a 36", 12' tall riser and a 100' long 30" barrel (36" diameter x 12 ft length) + (30" diameter x 100 ft. length) = 3432 Diameter-inch feet.. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Before Situation:

The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

After Situation:

Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Channel Bed Stabilization (584), Dike (356), Grassed Waterway (412), Structure for Water Control (587), and Irrigation Canal or Lateral (320) will use the corresponding Standard(s) as appropriate.

Feature Measure: (Riser Length x diameter in inches)

Scenario Unit: Diameter Inch Foot

Scenario Typical Size: 3,432.0

Scenario Total Cost: $16,113.82

Scenario Cost/Unit: $4.70

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	600	$2,514.00
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$5.40	100	$540.00
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$100.83	4	$403.32
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	11	$375.32
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	10	$241.90
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	4	$134.56
Materials						
Steel, Plate, 1/8 in.	1047	Flat Steel Plate, 1/8 inch thick, materials only.	Square Feet	$4.01	30	$120.30
Pipe, Steel, 30 in., Std Wt, USED	1361	Materials: - USED - 30 inch - Steel Std Wt	Feet	$95.23	100	$9,523.00
Pipe, Steel, 36 in., Std Wt, USED	1362	Materials: - USED - 36 inch - Steel Std Wt	Feet	$134.72	12	$1,616.64
Steel, Plate, 3/8 in.	1375	Flat steel plate, 3/8 inch thickness. Materials only.	Square Feet	$12.03	9	$108.27
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	1	$65.09
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 410 - Grade Stabilization Structure

Scenario: #8 - Weir Drop Structures

Scenario Description:

A Straight, semicircular, or Box Drop structure composed of metal or reinforced concrete used to stabilized the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a semicircular steel toe wall structure with a drop of 3ft and weir length of 30ft (90 square feet). The unit of payment measurement is defined as weir length times drop in "feet". The drop (feet) is defined as the structure inlet crest elevation minus the control outlet elevation (ie: outlet apron elevation).Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Before Situation:

The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

After Situation:

Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Channel Bed Stabilization (584), Dike (356), Grassed Waterway (412), Structure for Water Control (587), Subsurface Drain (606), and Underground Outlet (620) will use the corresponding Standard(s) as appropriate.

Feature Measure: Feet of Weir length times Drop Hei

Scenario Unit: Square Feet

Scenario Typical Size: 90.0

Scenario Total Cost: $9,781.71

Scenario Cost/Unit: $108.69

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$494.40	9	$4,449.60
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.37	9	$12.33
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	40	$83.20
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	75	$314.25
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$100.83	5	$504.15
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	10	$341.20
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	30	$725.70
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	5	$168.20
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	3	$90.21
Rock Riprap, graded, angular, material and shipping	1200	Graded Rock Riprap for all gradation ranges. Includes materials and delivery only.	Ton	$31.63	11	$347.93
Corrugated Steel, 12 Gauge, galvanized	1376	Corrugated Steel, 12 gauge, 3 inch by 1 inch corrugations, galvanized, meets ASTM A 929. Materials only.	Square Feet	$10.59	212	$2,245.08
Pipe, CMP, 12 in., 14 Gauge	1377	12 inch - Corrugated Steel Pipe. Galvanized, uncoated. 14 Gauge. Materials only.	Feet	$14.22	2	$28.44
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 410 - Grade Stabilization Structure

Scenario: #9 - Rock Drop Structures

Scenario Description:

A Straight Drop structure constructed of rock riprap held in place by galvanized wire, such as, gabion baskets, fence panels, or "sausage" baskets. These structures are used to stabilized the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a gabion wall structure with a drop of 3 ft and weir length of 8 ft (24 square feet). The unit of payment measurement is defined as weir length times drop in "feet". The drop (feet) is defined as the structure inlet crest elevation minus the control outlet elevation (ie: outlet apron elevation).Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Before Situation:

The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

After Situation:

Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Channel Bed Stabilization (584), Dike (356), Grassed Waterway (412), Structure for Water Control (587), Subsurface Drain (606), and Underground Outlet (620) will use the corresponding Standard(s) as appropriate.

Feature Measure: Feet of Weir length times Drop Hei

Scenario Unit: Square Feet

Scenario Typical Size: 24.0

Scenario Total Cost: $3,309.69

Scenario Cost/Unit: $137.90

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.37	23	$31.51
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	7	$14.56
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	40	$167.60
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$100.83	5	$504.15
Tractor, agricultural, 210 HP	1201	Agricultural tractor with horsepower range of 190 to 240. Equipment and power unit costs. Labor not included.	Hours	$87.16	3	$261.48
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	10	$241.90
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	5	$168.20
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	10	$453.40
Materials						
Gabion basket or mat	1378	Gabion baskets or mats installed and filled on grade, includes materials, transport, equipment, and labor, does not include geotextile fabric.	Cubic Yards	$142.21	7	$995.47
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 410 - Grade Stabilization Structure

Scenario: #10 - Log Drop Structures

Scenario Description:

A Straight Drop structure constructed using bioengineering principles. In this instance the drop structure is constructed of logs, rock riprap, and earthfill. These structures are used to stabilized the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon an 8 foot weir length and 3 foot drop. The unit of payment measurement is each. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Before Situation:

The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

After Situation:

Area is stabilized using using an engineered structure utilizing natural materials (bioengineered). The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Channel Bed Stabilization (584), Dike (356), Grassed Waterway (412), Structrue for Water Control (587), Subsurface Drain (606), and Underground Outlet (620) will use the corresponding Standard(s) as appropriate.

Feature Measure: Each

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $4,824.89

Scenario Cost/Unit: $4,824.89

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.37	11	$15.07
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	10	$20.80
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	40	$167.60
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$100.83	12	$1,209.96
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.59	4	$26.36
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	1	$22.29
Tractor, agricultural, 210 HP	1201	Agricultural tractor with horsepower range of 190 to 240. Equipment and power unit costs. Labor not included.	Hours	$87.16	20	$1,743.20
Trailer, flatbed, small	1505	Small flatbed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included.	Hours	$7.55	1	$7.55
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	20	$483.80
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	1	$26.46
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	12	$403.68
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	5	$226.70
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 410 - Grade Stabilization Structure

Scenario: #11 - Rock Dam

Scenario Description:

A structure constructed of rock riprap that is hand laid in place with a series of footer rocks embedded into the gulley floor then a layer of large similarly sized rocks laid on top of footers from bank to bank and at least as far up stream as wide. The function of the One rock dam is not to stop the water and then allow it to plunge over the down stream end during high water events, but to slow the water allowing it to pass through the structure effectively raising the bed of the channel to reestablish flood plain connectivity. These structures are used to restore the natural hydrology of entrenched swales and intermittent streams resulting in increased vegetative production and the natural restoration of the ecological site plant community. Cost estimate is based upon a One rock dam 2ft tall (measured from lowest part of channel floor - Thalweg) X 10ft wide X 8ft long structure (80 square feet). The unit of payment measurement is defined as length from furthest upstream part of structure to furthest down stream part of structure times width being the widest extent of structure when measured from channel bank to channel bank "square feet". Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion, water quality degradation, Plant Condition and health, wildlife habitat degradation and T&E/ State Species of Concern (critical Sage Grouse brood rearing habitat).

Before Situation:

The operator presently has entrenched swales or intermittent streams in rangeland or other land use. The entrenched systems are lowering the water table, reducing vegetative productivity, changing vegetation type, degrading forage and degrading wildlife habitat (critical sage grouse brood rearing habitat). Erosion from the entrenched systems is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

After Situation:

The function of the one rock dam is not to stop the water and then allow it to plunge over the down stream end during high water events, but to slow the water allowing it to pass through the structure effectively raising the bed of the channel to reestablish flood plain connectivity. These structures are used to restore the natural hydrology of entrenched swales and intermittent streams resulting in increased vegetative production and the natural restoration of the ecological site plant community.

Feature Measure: Feet of structure length times feet

Scenario Unit: Square Feet

Scenario Typical Size: 80.0

Scenario Total Cost: $857.83

Scenario Cost/Unit: $10.72

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Hydraulic Excavator, .5 CY	930	Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included.	Hours	$57.32	1	$57.32
Hauling, bulk, highway truck	1615	Hauling of bulk earthfill, rockfill, waste or debris. One-way travel distance using fully loaded highway dump trucks (typically 16 CY or 20 TN capacity). Includes equipment and labor for truck only. Does not include cost for loading truck.	Cubic Yard Mile	$0.28	83	$23.24
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	4	$96.76
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	1	$26.46
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	1	$45.34
Materials						
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic Yards	$22.79	1	$22.79
Rock Riprap, graded, angular, material and shipping	1200	Graded Rock Riprap for all gradation ranges. Includes materials and delivery only.	Ton	$31.63	8.5	$268.86
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	2	$317.06

Practice: 410 - Grade Stabilization Structure

Scenario: #12 - Rock Drop Structures - remote locations

Scenario Description:

A Straight Drop structure constructed of rock riprap held in place by galvanized wire, such as, gabion baskets, fence panels, or "sausage" baskets. These structures are used to stabilized the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a gabion wall structure with a drop of 3 ft and weir length of 8 ft (24 square feet). The unit of payment measurement is defined as weir length times drop in "feet". The drop (feet) is defined as the structure inlet crest elevation minus the control outlet elevation (ie: outlet apron elevation).Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation. This scenario is strictly for use in remote locations that are at least 50 miles or more from the source of equipment or materials.

Before Situation:

The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

After Situation:

Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Channel Bed Stabilization (584), Dike (356), Grassed Waterway (412), Structure for Water Control (587), Subsurface Drain (606), and Underground Outlet (620) will use the corresponding Standard(s) as appropriate.

Feature Measure: Feet of Weir length times Drop Hei

Scenario Unit: Square Feet

Scenario Typical Size: 24.0

Scenario Total Cost: $3,909.69

Scenario Cost/Unit: $162.90

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.37	23	$31.51
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	7	$14.56
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	40	$167.60
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$100.83	5	$504.15
Tractor, agricultural, 210 HP	1201	Agricultural tractor with horsepower range of 190 to 240. Equipment and power unit costs. Labor not included.	Hours	$87.16	3	$261.48
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	10	$241.90
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	5	$168.20
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	10	$453.40
Materials						
Gabion basket or mat	1378	Gabion baskets or mats installed and filled on grade, includes materials, transport, equipment, and labor, does not include geotextile fabric.	Cubic Yards	$142.21	7	$995.47
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	600	$600.00
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 410 - Grade Stabilization Structure

Scenario: #30 - Rock and Brush Structure/Zuni Bowls

Scenario Description:

Typical setting is on range/pasture or forest lands where ephemeral gullies and/or channels have formed and are actively head cutting. Typical installation consists of stabilizing the gully by installing a series of four rock and brush dams with a top width of 1', average height of 4', 12' length, and 1.5:1 side slopes, ; containing an average of 15 cy rock for a total of 60 cy. The rock and brush dams are constructed by hand placing successive layers of brush then rock; brush is typically fresh cut from live evergreen trees with stem diameters less than 1.5 inches; rock is typically 6"-9" diameter. Dams are keyed into the bank and are formed with a weir section. This scenario is also used for "Zuni bowl" installations that do not use any brush. Addresses resource concerns such as water quality degradation and soil erosion-concentrated flow erosion.

Before Situation:

The operator presently has erosion gullies forming and/or worsening on the range or forest land and impacting the useable grazing area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

After Situation:

Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed vegetation of disturbed areas use Critical Area Planting (342).

Feature Measure: Cubic Yards of rock installed

Scenario Unit: Cubic Yards

Scenario Typical Size: 60.0

Scenario Total Cost: $7,381.44

Scenario Cost/Unit: $123.02

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	96	$2,322.24
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic Yards	$84.32	60	$5,059.20

Practice: 412 - Grassed Waterway

Scenario: #1 - Waterway

Scenario Description:

Typical practice is 1200 ' long, 12' bottom, 8:1 side slopes, 1.5' depth, half excavation. A grass waterway that is a shaped or graded channel and is established with suitable vegetation to carry surface water at a non-erosive velocity to a stable outlet. This practice addresses Concentrated Flow Erosion (Classic Gully & Ephemeral Erosion) and Excessive Sediment in surface waters. Waterway area measured from top of bank to top of bank. Seeding area is 20% greater than waterway area to account for disturbed areas. Costs include excavation and associated work to construct the overall shape and grade of the waterway.

Before Situation:

The field has a small gulley which is cutting deeper into the field as time goes on so it needs to be stopped or controlled. Excessive sedimentation and soil erosion as a result from ephemeral or classic gully erosion. Gully has formed in field as a result of excessive runoff and poor cropping techniques. Grassed waterway is also commonly installed to convey runoff from concentrated flows, terrarces, diversions, or water control structures or similar practices to a suitable, stable outlet.

After Situation:

Installed grassed waterway is 1200 ' long, 12' bottom, 8:1 side slopes, 1.5' depth. The practice is installed using a dozer. Use Critical Area Planting (342) for establishment of waterway vegetation. If erosion control blankets or mulching for seedbed establishment/protection are needed, use conservation practice Mulching (484). Drainage tile, if needed, will be installed according to Subsurface Drain (606). Outlets, if needed will be installed using Structure for Water Control (587). If inlet Structures are needed with the drainage tile, then those will be installed using Underground Outlet (620).

Feature Measure: Acre of Waterway

Scenario Unit: Acres

Scenario Typical Size: 1.0

Scenario Total Cost: $1,609.81

Scenario Cost/Unit: $1,609.81

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, common earth, large equipment, 50 ft	1222	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yards	$1.54	800	$1,232.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	4	$96.76
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	1	$45.34
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 412 - Grassed Waterway

Scenario: #2 - Waterway - with Fabric Check Structures

Scenario Description:

Typical practice is 1200 ' long, 12' bottom, 8:1 side slopes, 1.5' depth, half excavation. A grass waterway that is a shaped or graded channel and is established with suitable vegetation to carry surface water at a non-erosive velocity to a stable outlet. Fabric or stone checks are installed every 100 feet along the length of the waterway perpendicular to waterflow and are 2/3 the waterway top width to reduce maintenance and provide temporary protection until vegetation is established. Fabric Checks are installed 18" deep with 12" laid over on the surface. (Alternatively, rock checks could be installed). This practice addresses Concentrated Flow Erosion (Classic Gully & Ephemeral Erosion) and Excessive Sediment in surface waters. Waterway area measured from top of bank to top of bank. Seeding area is 20% greater than waterway area to account for disturbed areas. Costs include excavation and associated work to construct the overall shape and grade of the waterway.

Before Situation:

The field has a small gulley which is cutting deeper into the field as time goes on so it needs to be stopped or controlled. Excessive sedimentation and soil erosion as a result from ephemeral or classic gully erosion. Gully has formed in field as a result of excessive runoff and poor cropping techniques. Grassed waterway is also commonly installed to convey runoff from concentrated flows, terrarces, diversions, or water control structures or similar practices to a suitable, stable outlet.

After Situation:

Installed grassed waterway is 1200 ' long, 12' bottom, 8:1 side slopes, 1.5' depth. Fabric checks are installed every 100 feet along the length of the waterway. The practice is installed using a dozer. Fabric or stone checks are installed with small backhoe and labor. Use Critical Area Planting (342) for establishment of waterway vegetation. If erosion control blankets or mulching for seedbed establishment/protection are needed, use conservation practice Mulching (484). Drainage tile, if needed, will be installed accoring to Subsurface Drain (606). Outlets, if needed will be installed using Structure for Water Control (587). If inlet Structures are needed with the drainage tile, then those will be installed using Underground Outlet (620).

Feature Measure: Acre of Waterway

Scenario Unit: Acres

Scenario Typical Size: 1.0

Scenario Total Cost: $2,535.61

Scenario Cost/Unit: $2,535.61

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	33	$68.64
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$5.40	33	$178.20
Excavation, common earth, large equipment, 50 ft	1222	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yards	$1.54	800	$1,232.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	12	$290.28
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	2	$90.68
Materials						
Geotextile, non-woven, light weight	1209	Non-woven less than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only.	Square Yard	$1.64	132	$216.48
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	1	$65.09
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 420 - Wildlife Habitat Planting

Scenario: #209 - Specialized Habitat Requirements on Non-Cropland, no Foregone Income

Scenario Description:

A wildlife habitat evaluation or plant community inventory indicates a potential to improve wildlife habitat by altering the current vegetation conditions (species diversity, richness, structure and pattern) by establishing herbaceous plants. This practice scenario applies to areas not in production (e.g. – fallow areas, forest understory, and non-cropped areas in and around crop fields). The inadequate wildlife habitat resource concern is met by planting a specialized and often diverse mix of seeds that is NOT readily available for purchase. Seed is not available from traditional agricultural vendors and requires making a special order. Cost of seed is high due to limited availability. Plant materials selected are needed to meet specific habitat requirements or ecosystem functions. Planting will be completed in combination with control of pervasive weeds. Intensive site preparation and post- planting weed management (e.g. mowing) is necessary for establishment of desired species due to a well-established existing stand of undesirable vegetation. Control or suppression of existing vegetation, including noxious or invasive species prior to and after planting is accomplished through the successful implementation of other practice standards, including CPS 314 or CPS 315.

Before Situation:

Vegetative habitat conditions (species diversity, richness, structure and pattern) do not meet planning criteria and do not have the potential to meet or exceed the minimum criteria through vegetative management activities alone. Current conditions and management are insufficient to address identified limiting habitat factor(s) or to increase planning criteria above a current planning criterion of at least 50% of the potential.

After Situation:

Desired species have been planted and the Wildlife Habitat Planting criteria have been successfully implemented. The species of vegetation selected will provide the identified habitat requirements for target species once it has successfully established. As a result, the site will meet or exceed planning criteria for inadequate wildlife habitat.

Feature Measure: acres planted (per acre)

Scenario Unit: Acres

Scenario Typical Size: 5.0

Scenario Total Cost: $5,526.39

Scenario Cost/Unit: $1,105.28

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	5	$101.55
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	2	$90.68
Materials						
Native Perennial Grasses, Legumes and/or Forbs Mix for Targeted Wildlife/Pollinator Habitat or Ecological Restoration, limited species availability.	2618	Diverse mix of native perennial grasses, legumes and forbs, less than 50% grasses, may include biennials and a small percentage of annual species for establishment purposes and/or if allowed by the CPS. This is a mix composed of species required to meet specific wildlife/pollinator habitat or ecological requirements. Seed is moderately easy to purchase commercially. Includes materials and shipping.	Acres	$1,019.69	5	$5,098.45
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 420 - Wildlife Habitat Planting

Scenario: #210 - High Species Diversity on Cropland with Foregone Income

Scenario Description:

A wildlife habitat evaluation or plant community inventory indicates a potential to improve wildlife habitat by altering the current vegetation conditions (species diversity, richness, structure and pattern) and changing use (annual crop to permanent vegetation) by establishing herbaceous plants. This practice scenario applies to cropland currently in production. The inadequate wildlife habitat resource concern is met by planting a specialized and often diverse mix of seeds that is NOT readily available for purchase. Seed is not available from traditional agricultural vendors and requires making a special order. Cost of seed is high due to limited availability. Plant materials selected are needed to meet specific habitat requirements or ecosystem functions. Weed pressure is minimal due to current and past management. Intensive site preparation and post- planting weed management is NOT necessary for establishment. Control or suppression of existing undesirable vegetation is accomplished through a single herbicide treatment at time, or just prior to planting and is included in this scenarios payment rate

Before Situation:

Vegetative habitat conditions (species diversity, richness, structure and pattern) do not meet planning criteria and do not have the potential to meet or exceed the minimum criteria through vegetative management activities alone. Current conditions and management are insufficient to address identified limiting habitat factor(s) or to increase planning criteria above a current planning criterion of at least 50% of the potential.

After Situation:

The land is no longer in production. Desired species have been planted and the Wildlife Habitat Planting criteria have been successfully implemented. The species of vegetation selected will provide the identified habitat requirements for target species once it has successfully established. As a result, the site will meet or exceed planning criteria for inadequate wildlife habitat.

Feature Measure: acres planted (per acre)

Scenario Unit: Acres

Scenario Typical Size: 5.0

Scenario Total Cost: $4,027.66

Scenario Cost/Unit: $805.53

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	5	$26.70
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	5	$101.55
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$215.46	5	$1,077.30
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	4	$181.36
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$9.21	5	$46.05
Native Perennial Grasses, Legumes and/or Forb Mix for Targeted Wildlife/Pollinator Habitat or Ecological Restoration, moderate commercial availability	2619	Diverse mix of native perennial grasses, legumes and forbs, less than 50% grasses, may include biennials and a small percentage of annual species for establishment purposes and/or if allowed by the CPS. This is a mix composed of species required to meet specific wildlife/pollinator habitat or ecological requirements. Seed is moderately easy to purchase commercially. Includes materials and shipping.	Acres	$458.78	5	$2,293.90
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	1	$65.09
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 420 - Wildlife Habitat Planting

Scenario: #211 - Specialized Habitat Requirements on Cropland with Foregone Income

Scenario Description:

A wildlife habitat evaluation or plant community inventory indicates a potential to improve wildlife habitat by altering the current vegetation conditions (species diversity, richness, structure and pattern) and changing use (annual crop to permanent vegetation) by establishing herbaceous plants. This practice scenario applies to cropland currently in production. The inadequate wildlife habitat resource concern is met by planting a moderately diverse mix of seeds that is readily available for purchase from multiple vendors. Seed is typically not available from traditional agricultural vendors and requires making a special order or ordering online. Weed pressure is minimal due to current and past management. Intensive site preparation and post- planting weed management is NOT necessary for establishment. Control or suppression of existing undesirable vegetation is accomplished through a single herbicide treatment at time, or just prior to planting and is included in this scenarios payment rate.

Before Situation:

Vegetative habitat conditions (species diversity, richness, structure and pattern) do not meet planning criteria and have the potential to meet or exceed the minimum criteria. Current conditions and management are insufficient to address identified limiting habitat factor(s) or to increase planning criteria above a current planning criterion of at least 50% of the potential.

After Situation:

The land is no longer in production. Desired species have been planted and the Wildlife Habitat Planting criteria have been successfully implemented. The species of vegetation selected will provide the identified habitat requirements for target species once it has successfully established. As a result, the site will meet or exceed planning criteria for inadequate wildlife habitat.

Feature Measure: acres planted (per acre)

Scenario Unit: Acres

Scenario Typical Size: 5.0

Scenario Total Cost: $6,755.03

Scenario Cost/Unit: $1,351.01

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	5	$26.70
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	5	$101.55
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$215.46	5	$1,077.30
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	4	$181.36
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$9.21	5	$46.05
Native Perennial Grasses, Legumes and/or Forbs Mix for Targeted Wildlife/Pollinator Habitat or Ecological Restoration, limited species availability.	2618	Diverse mix of native perennial grasses, legumes and forbs, less than 50% grasses, may include biennials and a small percentage of annual species for establishment purposes and/or if allowed by the CPS. This is a mix composed of species required to meet specific wildlife/pollinator habitat or ecological requirements. Seed is moderately easy to purchase commercially. Includes materials and shipping.	Acres	$1,019.69	5	$5,098.45
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	1	$65.09
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53

Practice: 420 - Wildlife Habitat Planting

Scenario: #212 - Very Small Acreage (<.5 ac) Planting with Seedlings

Scenario Description:

***This scenario should be limited to very small areas. *** A wildlife habitat evaluation or plant community inventory indicates a potential to improve wildlife habitat by altering the current vegetation conditions (species diversity, richness, structure and pattern) by establishing small patches of native shrubs. It has been determined that small patches of strategically placed shrub habitat offer vital habitat components for target species. Participant will typically hire labor to assist with portions of implementation. Site requires mechanical and chemical site preparation to ensure a suitable plant bed and adequate weed control. Both actions are included in this scenario. Utilizing plugs/sprigs/potted plants following plant bed preparation is needed to ensure successful establishment due to site restrictions.

Before Situation:

Vegetative habitat conditions (species diversity, richness, structure and pattern) do not meet planning criteria and have the potential to meet or exceed the minimum criteria. Current conditions and management are insufficient to address identified limiting habitat factor(s) or to increase planning criteria above a current planning criterion of at least 50% of the potential.

After Situation:

The Wildlife Habitat Planting criteria have been successfully implemented. The site has been mechanically and chemically treated and planting has occurred. The area is adequately stocked with desired species and full coverage of permanent vegetation is expected. The vegetative cover will provide the desired habitat requirements for target wildlife. The site meets or exceeds planning criteria for inadequate wildlife habitat.

Feature Measure: acres planted (per 1/4 acre)

Scenario Unit: Acres

Scenario Typical Size: 0.3

Scenario Total Cost: $6,783.34

Scenario Cost/Unit: $27,133.35

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	0.25	$2.47
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acres	$8.00	0.25	$2.00
Chemical, ground application, forested land	1313	Chemical application performed by ground equipment where trees and terrain impede passage of wide boom sprayers. Utilizes forestry application methods that include heavy equipment such as skidders. Includes material, equipment, power unit and labor costs.	Acres	$102.49	0.25	$25.62
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	4	$96.76
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	4	$181.36
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$9.21	0.25	$2.30
Tree & Shrub, Specialty	1523	Locally-sourced, culturally significant, native, or other highly specialized trees and shrubs (e.g., American chestnut, American elm, Canada yew, Sagebrush). Potted or balled and burlapped tree or shrub, 5 gallon. Includes materials and shipping only.	Each	$9.19	680	$6,249.20
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	1	$65.09
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53

Practice: 420 - Wildlife Habitat Planting

Scenario: #213 - Low Species Diversity on Non-Cropland, no Foregone Income

Scenario Description:

A wildlife habitat evaluation or plant community inventory indicates a potential to improve wildlife habitat by altering the current vegetation conditions (species diversity, richness, structure and pattern) by establishing herbaceous plants. This practice scenario applies to areas not in production (e.g. – fallow areas, forest understory, and non-cropped areas in and around crop fields). The inadequate wildlife habitat resource concern is met by planting a low diversity, low cost mix of readily available seeds in combination with control of pervasive weeds. Intensive site preparation and post- planting weed management (e.g. mowing) is necessary for establishment of desired species due to a well-established existing stand of undesirable vegetation. Control or suppression of existing vegetation, including noxious or invasive species prior to and after planting is accomplished through the successful implementation of other practice standards, including CPS 314 or CPS 315.

Before Situation:

Vegetative habitat conditions (species diversity, richness, structure and pattern) do not meet planning criteria and do not have the potential to meet or exceed the minimum criteria through vegetative management activities alone. Current conditions and management are insufficient to address identified limiting habitat factor(s) or to increase planning criteria above a current planning criterion of at least 50% of the potential.

After Situation:

Desired species have been planted and the Wildlife Habitat Planting criteria have been successfully implemented. The species of vegetation selected will provide the identified habitat requirements for target species once it has successfully established. As a result, the site will meet or exceed planning criteria for inadequate wildlife habitat.

Feature Measure: acres planted (per acre)

Scenario Unit: Acres

Scenario Typical Size: 5.0

Scenario Total Cost: $1,255.51

Scenario Cost/Unit: $251.10

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	5	$101.55
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	2	$90.68
Materials						
Native Perennial Grasses, Legumes and/or Forbs, Low Density	2753	A mix of native perennial grasses, legumes, and/or forbs, grasses typically greater than 50% of the mix, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Species typically easy to purchase. Includes material and shipping.	Acres	$180.95	5	$904.75
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53

Practice: 420 - Wildlife Habitat Planting

Scenario: #214 - Low Species Diversity on Cropland with Foregone Income

Scenario Description:

A wildlife habitat evaluation or plant community inventory indicates a potential to improve wildlife habitat by altering the current vegetation conditions (species diversity, richness, structure and pattern) and changing use (annual crop to permanent vegetation) by establishing herbaceous plants. This practice scenario applies to cropland currently in production. The inadequate wildlife habitat resource concern is met by planting a low diversity, low cost mix of readily available seeds. Weed pressure is minimal due to current and past management. Intensive site preparation and post- planting weed management is NOT necessary for establishment. Control or suppression of existing undesirable vegetation is accomplished through a single herbicide treatment at time, or just prior to planting and is included in this scenarios payment rate. Post planting weed treatment may be necessary and will be accomplished by applying additional practice standards (e.g. – CPS 314 & CPS 315)

Before Situation:

Vegetative habitat conditions (species diversity, richness, structure and pattern) do not meet planning criteria and do not have the potential to meet or exceed the minimum criteria through vegetative management activities alone. Current conditions and management are insufficient to address identified limiting habitat factor(s) or to increase planning criteria above a current planning criterion of at least 50% of the potential.

After Situation:

The land is no longer in production. Desired species have been planted and the Wildlife Habitat Planting criteria have been successfully implemented. The species of vegetation selected will provide the identified habitat requirements for target species once it has successfully established. As a result, the site will meet or exceed planning criteria for inadequate wildlife habitat

Feature Measure: acres planted (per acre)

Scenario Unit: Acres

Scenario Typical Size: 5.0

Scenario Total Cost: $2,561.33

Scenario Cost/Unit: $512.27

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	5	$26.70
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	5	$101.55
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$215.46	5	$1,077.30
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	4	$181.36
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$9.21	5	$46.05
Native Perennial Grasses, Legumes and/or Forbs, Low Density	2753	A mix of native perennial grasses, legumes, and/or forbs, grasses typically greater than 50% of the mix, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Species typically easy to purchase. Includes material and shipping.	Acres	$180.95	5	$904.75
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	1	$65.09
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53

Practice: 420 - Wildlife Habitat Planting

Scenario: #215 - High Species Diversity on Fallow or Non-Cropland, no Foregone Income

Scenario Description:

A wildlife habitat evaluation or plant community inventory indicates a potential to improve wildlife habitat by altering the current vegetation conditions (species diversity, richness, structure and pattern) by establishing herbaceous plants. This practice scenario applies to areas not in production (e.g. – fallow areas, forest understory, and non-cropped areas in and around crop fields). The inadequate wildlife habitat resource concern is met by planting a moderately diverse mix of seeds that is readily available for purchase from multiple vendors. Seed is typically not available from traditional agricultural vendors and requires making a special order or ordering online. Planting will be completed in combination with control of pervasive weeds. Intensive site preparation and post- planting weed management (e.g. mowing) is necessary for establishment of desired species due to a well-established existing stand of undesirable vegetation. Control or suppression of existing vegetation, including noxious or invasive species prior to and after planting is accomplished through the successful implementation of other practice standards, including CPS 314 or CPS 315.

Before Situation:

Vegetative habitat conditions (species diversity, richness, structure and pattern) do not meet planning criteria and do not have the potential to meet or exceed the minimum criteria through vegetative management activities alone. Current conditions and management are insufficient to address identified limiting habitat factor(s) or to increase planning criteria above a current planning criterion of at least 50% of the potential.

After Situation:

Desired species have been planted and the Wildlife Habitat Planting criteria have been successfully implemented. The species of vegetation selected will provide the identified habitat requirements for target species once it has successfully established. As a result, the site will meet or exceed planning criteria for inadequate wildlife habitat.

Feature Measure: acres planted (per acre)

Scenario Unit: Acres

Scenario Typical Size: 5.0

Scenario Total Cost: $2,644.66

Scenario Cost/Unit: $528.93

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	5	$101.55
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	2	$90.68
Materials						
Native Perennial Grasses, Legumes and/or Forb Mix for Targeted Wildlife/Pollinator Habitat or Ecological Restoration, moderate commercial availability	2619	Diverse mix of native perennial grasses, legumes and forbs, less than 50% grasses, may include biennials and a small percentage of annual species for establishment purposes and/or if allowed by the CPS. This is a mix composed of species required to meet specific wildlife/pollinator habitat or ecological requirements. Seed is moderately easy to purchase commercially. Includes materials and shipping.	Acres	$458.78	5	$2,293.90
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53

Practice: 428 - Irrigation Ditch Lining

Scenario: #1 - Concrete Lining, 1 ft bottom

Scenario Description:

Construct quarter mile of concrete (2.5 inch in thickness) lining in an existing ditch alignment to convey water from the source of supply to a field or fields in a farm distribution system. Typical scenario includes filling the old ditch with on-site fill material, compacting, and constructing an 8 ft pad with on site fill material. This scenario does not include any check or outlets gates. A trapezoidal trencher forms the ditch (typical cross-section: 1 ft bottom, 2.5 feet depth including freeboard, and 1:1 side slope) and lining with concrete slip forms (total width = 8.07 ft). Resource Concerns: Insufficient water - Inefficient use of irrigation water; Soil erosion - Excessive bank erosion from streams shorelines or channels. Associated Practices: 320-Irrigation Canal or Lateral; 388-Irrigation Field Ditch; 443-Irrigation System, Surface or Subsurface Water; 533-Pumping Plant; 430-Irrigation Pipeline; 587-Structure for Water Control.

Before Situation:

Leaky and erosive earthen irrigation ditch.

After Situation:

Impervious lining prevents seepage, reduces energy use and improves water quality and irrigation efficiency.

Feature Measure: Surface Area of Lining

Scenario Unit: Square Yard

Scenario Typical Size: 1,184.0

Scenario Total Cost: $28,582.25

Scenario Cost/Unit: $24.14

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	510	$1,060.80
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	978	$4,097.82
Concrete, CIP, Slab on Grade, non reinforced	1225	Non reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$266.87	82.2	$21,936.71
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	12	$544.08
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	4	$942.84

Practice: 428 - Irrigation Ditch Lining

Scenario: #2 - Concrete lined ditch-thick, 1.5 ft bottom

Scenario Description:

Construct quarter mile (1320') of concrete (3.0 inch in thickness) lining in an existing ditch alignment to convey water from the source of supply to a field or fields in a farm distribution system. Typical scenario includes filling the old ditch with on-site fill material, compacting, and constructing an 8 ft pad with on site fill material. This scenario does not include any check or outlets gates. A trapezoidal trencher forms the ditch (typical cross-section: 1.5 ft bottom, 2.5 ft depth including freeboard, and 1:1 side slope) and lining with concrete slip forms (total width = 8.57 ft). 1 foot bottom ditch is needed deliver expected water flows on realitively flat grades. Resource Concerns: Insufficient water - Inefficient use of irrigation water; Soil erosion - Excessive bank erosion from streams shorelines or channels. Associated Practices: 320-Irrigation Canal or Lateral; 388-Irrigation Field Ditch; 443-Irrigation System, Surface or Subsurface Water; 533-Pumping Plant; 430-Irrigation Pipeline; 587-Structure for Water Control.

Before Situation:

Leaky and erosive earthen irrigation ditch.

After Situation:

Impervious lining prevents seepage, reduces energy use and improves water quality and irrigation efficiency.

Feature Measure: Surface area of lining

Scenario Unit: Square Yard

Scenario Typical Size: 1,257.0

Scenario Total Cost: $35,208.60

Scenario Cost/Unit: $28.01

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	576	$1,198.08
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	1100	$4,609.00
Concrete, CIP, Slab on Grade, non reinforced	1225	Non reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$266.87	104.6	$27,914.60
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	12	$544.08
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	4	$942.84

Practice: 428 - Irrigation Ditch Lining

Scenario: #3 - Concrete Lining, 2 ft bottom

Scenario Description:

Construct quarter mile of concrete (2.5 inch in thickness) lining in an existing ditch alignment to convey water from the source of supply to a field or fields in a farm distribution system. Typical scenario includes filling the old ditch with on-site fill material, compacting, and constructing an 8 ft pad with on site fill material. This scenario does not include any check or outlets gates. A trapezoidal trencher forms the ditch (typical cross-section: 2 ft bottom, 2.5 ft depth including freeboard, and 1:1 side slope) and lining with concrete slip forms (total width = 9.07 ft). Two foot bottom ditch is needed for higher water flows (10+ cfs) on realitively flat grades. Resource Concerns: Insufficient water - Inefficient use of irrigation water; Soil erosion - Excessive bank erosion from streams shorelines or channels. Associated Practices: 320-Irrigation Canal or Lateral; 388-Irrigation Field Ditch; 443-Irrigation System, Surface or Subsurface Water; 533-Pumping Plant; 430-Irrigation Pipeline; 587-Structure for Water Control.

Before Situation:

Leaky and erosive earthen irrigation ditch.

After Situation:

Impervious lining prevents seepage, reduces energy use and improves water quality and irrigation efficiency.

Feature Measure: Surface area of lining

Scenario Unit: Square Yard

Scenario Typical Size: 1,330.0

Scenario Total Cost: $32,603.33

Scenario Cost/Unit: $24.51

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	643	$1,337.44
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	1222	$5,120.18
Concrete, CIP, Slab on Grade, non reinforced	1225	Non reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$266.87	92.4	$24,658.79
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	12	$544.08
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	4	$942.84

Practice: 428 - Irrigation Ditch Lining

Scenario: #4 - Concrete Lining, > 2 ft bottom

Scenario Description:

Construct quarter mile of concrete (2.5 inch in thickness) lining in an existing ditch alignment to convey water from the source of supply to a field or fields in a farm distribution system. Typical scenario includes filling the old ditch with on-site fill material, compacting, and constructing a 12 ft pad with on site fill material. This scenario does not include any check or outlets gates. A trapezoidal trencher forms the ditch (typical cross-section: 3 ft bottom, 2.5 ft depth including freeboard, and 1:1 side slope) and lining with concrete slip forms (total width = 10.07 ft). Three foot bottom ditch is needed for higher water flows (20+ cfs) on relatively flat grades. Resource Concerns: Insufficient water - Inefficient use of irrigation water; Soil erosion - Excessive bank erosion from streams shorelines or channels. Associated Practices: 320-Irrigation Canal or Lateral; 388-Irrigation Field Ditch; 443-Irrigation System, Surface or Subsurface Water; 533-Pumping Plant; 430-Irrigation Pipeline; 587-Structure for Water Control.

Before Situation:

Leaky and erosive earthen irrigation ditch.

After Situation:

Impervious lining prevents seepage, reduces energy use and improves water quality and irrigation efficiency.

Feature Measure: Surface area of lining

Scenario Unit: Square Yard

Scenario Typical Size: 1,477.0

Scenario Total Cost: $36,582.45

Scenario Cost/Unit: $24.77

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	743	$1,545.44
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	1466	$6,142.54
Concrete, CIP, Slab on Grade, non reinforced	1225	Non reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$266.87	102.7	$27,407.55
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	12	$544.08
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	4	$942.84

Practice: 428 - Irrigation Ditch Lining

Scenario: #5 - Notched Ditch, 1.5 ft bottom

Scenario Description:

Construct quarter mile (1320') of concrete (3.0 inch in thickness) lining in an existing ditch alignment with hand formed notches, located at the top of the ditch on field side, to convey water from the source of supply to a field or fields in a farm distribution system. Notches are typically spaced to match field crop row spacing and are wedge shaped with typical dimensions of 2" bottom width, 6'' top width and 6" deep. Typical scenario includes filling the old ditch with on-site fill material, compacting, and constructing an 8 ft pad with on site fill material. This scenario does not include any check or outlets gates. A trapezoidal trencher forms the ditch (typical cross-section: 1.5 ft bottom, 2.5 ft depth including freeboard, and 1:1 side slope) and lining with concrete slip forms (total width = 8.57 ft). 1.5 foot bottom ditch is needed deliver expected water flows on realitively flat grades. Resource Concerns: Insufficient water - Inefficient use of irrigation water; Soil erosion - Excessive bank erosion from streams shorelines or channels. Associated Practices: 320-Irrigation Canal or Lateral; 388-Irrigation Field Ditch; 443-Irrigation System, Surface or Subsurface Water; 533-Pumping Plant; 430-Irrigation Pipeline; 587-Structure for Water Control.

Before Situation:

Leaky and erosive earthen irrigation ditch.

After Situation:

Impervious lining prevents seepage, reduces energy use and improves water quality and irrigation efficiency.

Feature Measure: Surface area of lining

Scenario Unit: Square Yard

Scenario Typical Size: 1,257.0

Scenario Total Cost: $47,678.16

Scenario Cost/Unit: $37.93

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	576	$1,198.08
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	1100	$4,609.00
Concrete, CIP, Slab on Grade, non reinforced	1225	Non reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$266.87	115	$30,690.05
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	397	$9,603.43
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	14	$634.76
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	4	$942.84

Practice: 428 - Irrigation Ditch Lining

Scenario: #6 - Flexible Lining

Scenario Description:

Construct quarter mile of uncovered flexible membrane (30mil HDPE) lining in an existing ditch alignment to convey water from the source of supply to a field or fields in a farm distribution system. Typical scenario includes subgrade preparation via clearing & grubbing, shaping old channel with no bedding or geotextile cushion to place, and placing membrane with 8 inch tuck/anchor on each side (total liner width = 8 ft). Scenario assumes typical trapezoidal ditch (1 ft bottom, 2 ft depth including freeboard, and 1:1 side slope). Resource Concerns: Insufficient water - Inefficient use of irrigation water; Soil erosion - Excessive bank erosion from streams shorelines or channels. Associated Practices: 320-Irrigation Canal or Lateral; 388-Irrigation Field Ditch; 443-Irrigation System, Surface or Subsurface Water; 533-Pumping Plant; 430-Irrigation Pipeline; 587-Structure for Water Control.

Before Situation:

Leaky and erosive earthen irrigation ditch.

After Situation:

Impervious lining prevents seepage, reduces energy use and improves water quality and irrigation efficiency.

Feature Measure: Surface Area of Lining

Scenario Unit: Square Yard

Scenario Typical Size: 1,173.0

Scenario Total Cost: $9,878.14

Scenario Cost/Unit: $8.42

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$29.47	16	$471.52
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	48	$1,161.12
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	16	$423.36
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	48	$2,176.32
Materials						
Synthetic Liner, 30 mil	1238	Synthetic 30 mil HDPE, LLDPE, EPDM, etc. membrane liner material. Includes materials and shipping only.	Square Feet	$0.49	10560	$5,174.40
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 428 - Irrigation Ditch Lining

Scenario: #7 - Transitions

Scenario Description:

Construct short transition of concrete lining in an existing ditch alignment to convey water from one section of a ditch to another. Typical scenario includes hand placing concrete in the transition section where equipment cannot reach.

Before Situation:

need to connect one end of a ditch with a specific cross section to another ditch with the same or different cross section that may include placing a transition in a curve which requires hand placement.

After Situation:

Transitions prevents seepage and erosion at ditch joints, reduces energy use and improves water quality and irrigation efficiency.

Feature Measure: Surface area of lining

Scenario Unit: Square Feet

Scenario Typical Size: 120.0

Scenario Total Cost: $559.78

Scenario Cost/Unit: $4.66

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formless, non reinforced	36	Non reinforced concrete cast-in-placed without forms by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$184.90	1	$184.90
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	8	$193.52
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	4	$181.36

Practice: 428 - Irrigation Ditch Lining

Scenario: #8 - Semi Rigid HDPE Prefab Liner

Scenario Description:

Construct 1000 feet of uncovered semi-rigid HDPE liner in an existing ditch alignment to convey water from the source of supply to a field or fields in a farm distribution system. Typical scenario includes subgrade preparation via clearing & grubbing, shaping old channel to place,and placing edge anchors as required for installation. Scenario assumes typical trapezoidal ditch (1 ft bottom, 2 ft depth including freeboard, and 1:1 side slope). Total width is 8 ft. Resource Concerns: Insufficient water - Inefficient use of irrigation water; Soil erosion - Excessive bank erosion from streams shorelines or channels. Associated Practices: 320-Irrigation Canal or Lateral; 388-Irrigation Field Ditch; 443-Irrigation System, Surface or Subsurface Water; 533-Pumping Plant; 430-Irrigation Pipeline; 587-Structure for Water Control.

Before Situation:

Leaky and erosive earthen irrigation ditch.

After Situation:

Impervious lining prevents seepage, reduces energy use and improves water quality and irrigation efficiency.

Feature Measure: surface area of lining

Scenario Unit: Square Yard

Scenario Typical Size: 889.0

Scenario Total Cost: $43,508.81

Scenario Cost/Unit: $48.94

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	111	$230.88
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	50	$1,209.50
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	8	$362.72
Materials						
Ditch liner, HDPE, semi-rigid, 24 in. depth	2374	Semi-rigid, corrugated HDPE ditch liner, 24 inch depth. Materials only.	Feet	$41.47	1000	$41,470.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 428 - Irrigation Ditch Lining

Scenario: #9 - Concrete Lining, Hand Placed, Any Size

Scenario Description:

Construct quarter mile of concrete (3 inch in thickness) lining in an existing ditch alignment to convey water from the source of supply to a field or fields in a farm distribution system. Typical scenario includes filling the old ditch with on-site fill material, compacting, and constructing an 8 ft pad with on site fill material. This scenario does not include any check or outlets gates. A grader cuts the ditch section (typical cross-section: 2 ft bottom, 2.5 feet depth including freeboard, and 1:1 side slope) and lining with concrete by forming and hand placing concrete sections. This ditch type may also be used in certain situations when the back and front of the ditch are at different design elevations. Typical cy/lf is 0.0874. Resource Concerns: Insufficient water - Inefficient use of irrigation water; Soil erosion - Excessive bank erosion from streams shorelines or channels. Associated Practices: 320-Irrigation Canal or Lateral; 388-Irrigation Field Ditch; 443-Irrigation System, Surface or Subsurface Water; 533-Pumping Plant; 430-Irrigation Pipeline; 587-Structure for Water Control.

Before Situation:

Leaky and erosive earthen irrigation ditch.

After Situation:

Impervious lining prevents seepage, reduces energy use and improves water quality and irrigation efficiency.

Feature Measure: Cubic Yard of Concrete Lining

Scenario Unit: Cubic Yards

Scenario Typical Size: 115.4

Scenario Total Cost: $59,755.86

Scenario Cost/Unit: $517.82

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	510	$1,060.80
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	978	$4,097.82
Concrete, CIP, Slab on Grade, non reinforced	1225	Non reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$266.87	115.4	$30,796.80
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	720	$17,416.80
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	120	$5,440.80
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	4	$942.84

Practice: 430 - Irrigation Pipeline

Scenario: #7 - PVC Pipe <= 8 inch

Scenario Description:

Description: Description: Below ground installation of PVC (Plastic Irrigation Pipe) pipeline. PVC (PIP) is manufactured in sizes (nominal diameter) from 4-inch to 27-inch; typical practice sizes range from 4-inch to 24-inch; and typical scenario size is 6-inch. Construct 1/4 mile (1,320 feet) of 6-inch, Class 80 (SDR-51, PVC-Plastic Irrigation Pipe (PIP) pipeline with appurtenances, installed below ground with a minimum of 30 inches of ground cover. The unit is weight of pipe material in pounds. 1,320 feet of 6-inch, Class 80 (SDR-51) PVC-PIP pipe weighs 1.49 lb/ft, or a total of 1966 pounds. Appurtenances include: couplings, fittings, air vents, pressure relief valves, thrust blocks, and inline valves, and are included in the cost of pipe material (additional 10% of pipe material quantity). Cost of appurtenances does not include flow meters, riser pipe assemblies, or backflow preventers. Typical installation applies to soils with no special bedding requirements. Resource Concerns: Inefficient Use of Irrigation Water; Inefficient Energy Use. Associated Practices: 436 - Irrigation Reservoir; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 443 - Irrigation System, Surface & Subsurface; 447 - Irrigation System, Tailwater Recovery; 533 - Pumping Plant; 634 - Waste Transfer.

Before Situation:

Pipeline needed to replace or supplement inefficient irrigation conveyance systems.

After Situation:

Pipeline installed to convey and/or distribute water to irrigation systems or reservoirs, minimizing non-beneficial water use, reducing soil erosion, and/or reducing energy use.

Feature Measure: Weight of Pipe

Scenario Unit: Pound

Scenario Typical Size: 1,966.0

Scenario Total Cost: $8,070.04

Scenario Cost/Unit: $4.10

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Trenching, Earth, 12 in. x 48 in.	53	Trenching, earth, 12 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling	Feet	$1.24	1320	$1,636.80
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	40	$967.60
Materials						
Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.31	2162	$4,994.22
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 430 - Irrigation Pipeline

Scenario: #8 - PVC Pipe <= 8 inch with boring

Scenario Description:

Description: Below ground installation of PVC (Plastic Irrigation Pipe) pipeline. PVC (PIP) is manufactured in sizes (nominal diameter) from 4-inch to 27-inch; typical practice sizes range from 4-inch to 24-inch; and typical scenario size is 6-inch. Construct 500 feet of 6-inch, Class 80 (SDR-51, PVC-Plastic Irrigation Pipe (PIP) pipeline with appurtenances, installed below ground with a minimum of 30 inches of ground cover. This scenario includes 50 feet of boring. The unit is weight of pipe material in pounds. 500 feet of 6-inch, Class 80 (SDR-51) PVC-PIP pipe weighs 1.49 lb/ft, or a total of 745pounds. Appurtenances include: couplings, fittings, air vents, pressure relief valves, thrust blocks, and inline valves, and are included in the cost of pipe material (additional 10% of pipe material quantity). Cost of appurtenances does not include flow meters, riser pipe assemblies, or backflow preventers. Typical installation applies to soils with no special bedding requirements. Resource Concerns: Inefficient Use of Irrigation Water; Inefficient Energy Use. Associated Practices: 436 - Irrigation Reservoir; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 443 - Irrigation System, Surface & Subsurface; 447 - Irrigation System, Tailwater Recovery; 533 - Pumping Plant; 634 - Waste Transfer.

Before Situation:

Pipeline needed to replace or supplement inefficient irrigation conveyance systems.

After Situation:

Pipeline installed to convey and/or distribute water to irrigation systems or reservoirs, minimizing non-beneficial water use, reducing soil erosion, and/or reducing energy use.

Feature Measure: Weight of Pipe

Scenario Unit: Pound

Scenario Typical Size: 745.0

Scenario Total Cost: $9,438.70

Scenario Cost/Unit: $12.67

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Trenching, Earth, loam, 24 in. x 48 in.	54	Trenching, earth, loam, 24 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling	Feet	$2.58	500	$1,290.00
Horizontal Boring, Greater Than 3 in. diameter	1132	Includes equipment, labor and setup.	Feet	$100.18	50	$5,009.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	32	$774.08
Materials						
Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.31	820	$1,894.20
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 430 - Irrigation Pipeline

Scenario: #9 - PVC Pipe <= 8 inch with alfalfa valves

Scenario Description:

Description: Below ground installation of PVC (Plastic Irrigation Pipe) pipeline. PVC (PIP) is manufactured in sizes (nominal diameter) from 4-inch to 27-inch; typical practice sizes range from 4-inch to 24-inch; and typical scenario size is 6-inch. Construct 1/4 mile (1,320 feet) of 6-inch, Class 80 (SDR-51, PVC-Plastic Irrigation Pipe (PIP) pipeline with appurtenances, installed below ground with a minimum of 30 inches of ground cover. This scenario includes 4 alfalfa valves. The unit is weight of pipe material in pounds. 1,320 feet of 6-inch, Class 80 (SDR-51) PVC-PIP pipe weighs 1.49 lb/ft, or a total of 1966 pounds. Appurtenances include: couplings, fittings, air vents, pressure relief valves, thrust blocks, and inline valves, and are included in the cost of pipe material (additional 10% of pipe material quantity). Cost of appurtenances does not include flow meters, or backflow preventers. Typical installation applies to soils with no special bedding requirements. Resource Concerns: Inefficient Use of Irrigation Water; Inefficient Energy Use. Associated Practices: 436 - Irrigation Reservoir; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 443 - Irrigation System, Surface & Subsurface; 447 - Irrigation System, Tailwater Recovery; 533 - Pumping Plant; 634 - Waste Transfer.

Before Situation:

Pipeline needed to replace or supplement inefficient irrigation conveyance systems.

After Situation:

Pipeline installed to convey and/or distribute water to irrigation systems or reservoirs, minimizing non-beneficial water use, reducing soil erosion, and/or reducing energy use.

Feature Measure: Weight of Pipe

Scenario Unit: Pound

Scenario Typical Size: 1,966.0

Scenario Total Cost: $9,561.68

Scenario Cost/Unit: $4.86

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Trenching, Earth, 12 in. x 48 in.	53	Trenching, earth, 12 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling	Feet	$1.24	1320	$1,636.80
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	48	$1,161.12
Materials						
Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.31	2162	$4,994.22
Valve, Alfalfa valve with riser, PVC, 6 in.	2126	Alfalfa valve assembly including, 6 inch diameter metal alfalfa valve, PVC tee, 36 inch PVC riser for connection to a pipeline. Materials only.	Each	$324.53	4	$1,298.12
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 430 - Irrigation Pipeline

Scenario: #10 - PVC Pipe >= 10 inch

Scenario Description:

Description: Below ground installation of PVC (Plastic Irrigation Pipe) pipeline with diameters greater than or equal to 10 inches. PVC (PIP) is manufactured in sizes (nominal diameter) from 4-inch to 27-inch; typical practice sizes range from 4-inch to 24-inch; and typical scenario size is 12-inch. Construct 1/4 mile (1,320 feet) of 12-inch, Class 80 (SDR-51, PVC-Plastic Irrigation Pipe (PIP) pipeline with appurtenances, installed below ground with a minimum of 30 inches of ground cover. The unit is weight of pipe material in pounds. 1,320 feet of 12-inch, Class 80 (SDR-51) PVC-PIP pipe weighs 5.82 lb/ft, or a total of 7677 pounds. Appurtenances include: couplings, fittings, air vents, pressure relief valves, thrust blocks, and inline valves, and are included in the cost of pipe material (additional 10% of pipe material quantity). Cost of appurtenances does not include flow meters, riser pipe assemblies, or backflow preventers. Typical installation applies to soils with no special bedding requirements. Resource Concerns: Inefficient Use of Irrigation Water; Inefficient Energy Use. Associated Practices: 436 - Irrigation Reservoir; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 443 - Irrigation System, Surface & Subsurface; 447 - Irrigation System, Tailwater Recovery; 533 - Pumping Plant; 634 - Waste Transfer.

Before Situation:

Pipeline needed to replace or supplement inefficient irrigation conveyance systems.

After Situation:

Pipeline installed to convey and/or distribute water to irrigation systems or reservoirs, minimizing non-beneficial water use, reducing soil erosion, and/or reducing energy use.

Feature Measure: Weight of Pipe

Scenario Unit: Pound

Scenario Typical Size: 7,677.0

Scenario Total Cost: $24,546.09

Scenario Cost/Unit: $3.20

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Trenching, Earth, loam, 24 in. x 48 in.	54	Trenching, earth, loam, 24 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling	Feet	$2.58	1320	$3,405.60
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	48	$1,161.12
Materials						
Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.31	8445	$19,507.95
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 430 - Irrigation Pipeline

Scenario: #11 - PVC Pipe >= 10 inch with boring

Scenario Description:

Description: Below ground installation of PVC (Plastic Irrigation Pipe) pipeline with diameters greater than or equal to 10 inches. PVC (PIP) is manufactured in sizes (nominal diameter) from 4-inch to 27-inch; typical practice sizes range from 4-inch to 24-inch; and typical scenario size is 12-inch. Construct 500 feet of 12-inch, Class 80 (SDR-51, PVC-Plastic Irrigation Pipe (PIP) pipeline with appurtenances, installed below ground with a minimum of 30 inches of ground cover. This scenario includes 50 feet of boring. The unit is weight of pipe material in pounds. 500 feet of 12-inch, Class 80 (SDR-51) PVC-PIP pipe weighs 5.82 lb/ft, or a total of 2910 pounds. Appurtenances include: couplings, fittings, air vents, pressure relief valves, thrust blocks, and inline valves, and are included in the cost of pipe material (additional 10% of pipe material quantity). Cost of appurtenances does not include flow meters, riser pipe assemblies, or backflow preventers. Typical installation applies to soils with no special bedding requirements. Resource Concerns: Inefficient Use of Irrigation Water; Inefficient Energy Use. Associated Practices: 436 - Irrigation Reservoir; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 443 - Irrigation System, Surface & Subsurface; 447 - Irrigation System, Tailwater Recovery; 533 - Pumping Plant; 634 - Waste Transfer.

Before Situation:

Pipeline needed to replace or supplement inefficient irrigation conveyance systems.

After Situation:

Pipeline installed to convey and/or distribute water to irrigation systems or reservoirs, minimizing non-beneficial water use, reducing soil erosion, and/or reducing energy use.

Feature Measure: Weight of Pipe

Scenario Unit: Pound

Scenario Typical Size: 2,910.0

Scenario Total Cost: $15,132.33

Scenario Cost/Unit: $5.20

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Trenching, Earth, loam, 24 in. x 48 in.	54	Trenching, earth, loam, 24 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling	Feet	$2.58	500	$1,290.00
Horizontal Boring, Greater Than 3 in. diameter	1132	Includes equipment, labor and setup.	Feet	$100.18	50	$5,009.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	40	$967.60
Materials						
Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.31	3201	$7,394.31
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 430 - Irrigation Pipeline

Scenario: #12 - PVC Pipe >= 10 inch with alfalfa valves

Scenario Description:

Description: Below ground installation of PVC (Plastic Irrigation Pipe) pipeline with diameters greater than or equal to 10 inches. PVC (PIP) is manufactured in sizes (nominal diameter) from 4-inch to 27-inch; typical practice sizes range from 4-inch to 24-inch; and typical scenario size is 12-inch. Construct 1/4 mile (1,320 feet) of 12-inch, Class 80 (SDR-51, PVC-Plastic Irrigation Pipe (PIP) pipeline with appurtenances, installed below ground with a minimum of 30 inches of ground cover. This scenario includes 4 alfalfa valves. The unit is weight of pipe material in pounds. 1,320 feet of 12-inch, Class 80 (SDR-51) PVC-PIP pipe weighs 5.82 lb/ft, or a total of 7677 pounds. Appurtenances include: couplings, fittings, air vents, pressure relief valves, thrust blocks, and inline valves, and are included in the cost of pipe material (additional 10% of pipe material quantity). Cost of appurtenances does not include flow meters, or backflow preventers. Typical installation applies to soils with no special bedding requirements. Resource Concerns: Inefficient Use of Irrigation Water; Inefficient Energy Use. Associated Practices: 436 - Irrigation Reservoir; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 443 - Irrigation System, Surface & Subsurface; 447 - Irrigation System, Tailwater Recovery; 533 - Pumping Plant; 634 - Waste Transfer.

Before Situation:

Pipeline needed to replace or supplement inefficient irrigation conveyance systems.

After Situation:

Pipeline installed to convey and/or distribute water to irrigation systems or reservoirs, minimizing non-beneficial water use, reducing soil erosion, and/or reducing energy use.

Feature Measure: Weight of Pipe

Scenario Unit: Pound

Scenario Typical Size: 7,677.0

Scenario Total Cost: $29,069.37

Scenario Cost/Unit: $3.79

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Trenching, Earth, loam, 24 in. x 48 in.	54	Trenching, earth, loam, 24 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling	Feet	$2.58	1320	$3,405.60
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	64	$1,548.16
Materials						
Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.31	8445	$19,507.95
Valve, Alfalfa valve with riser, PVC, 14 in.	2130	Alfalfa valve assembly including, 14 inch diameter metal alfalfa valve, PVC tee, 36 inch PVC riser for connection to a pipeline. Materials only.	Each	$1,034.06	4	$4,136.24
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 430 - Irrigation Pipeline

Scenario: #13 - HDPE (Iron Pipe Size & Tubing)

Scenario Description:

Description: Below ground installation of HDPE (Iron Pipe Size & Tubing) pipeline. HDPE (IPS & Tubing) is manufactured in sizes (nominal diameter) from ½-inch to 24-inch; typical practice sizes range from 2-inch to 24-inch; and typical scenario size is 6-inch. Construct 1/4 mile (1,320 feet) of 6-inch, Class 130 (SDR-13.5), HDPE pipeline with appurtenances, installed below ground with a minimum 2 feet of ground cover. The unit is weight of pipe material in pounds. 1,320 feet of 8-inch, Class 130 (SDR-13.5), HDPE weighs 4.024 lb/ft, or a total of 5,312 pounds. Appurtenances include: fittings, air vents, pressure relief valves, thrust blocks, risers, and inline valves, and are included in the cost of pipe material (additional 10% of pipe material quantity). Cost of appurtenances does not include flow meters or backflow preventers. Typical installation applies to soils with no special bedding requirements. Resource Concerns: Inefficient Use of Irrigation Water; Inefficient Energy Use. Associated Practices: 436 - Irrigation Reservoir; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 443 - Irrigation System, Surface & Subsurface; 447 - Irrigation System, Tailwater Recovery; 533 - Pumping Plant; 634 - Waste Transfer.

Before Situation:

Pipeline needed to replace or supplement inefficient irrigation conveyance systems.

After Situation:

Pipeline installed to convey and/or distribute water to irrigation systems or reservoirs, minimizing non-beneficial water use, reducing soil erosion, and/or reducing energy use.

Feature Measure: Weight of Pipe

Scenario Unit: Pound

Scenario Typical Size: 5,312.0

Scenario Total Cost: $21,113.11

Scenario Cost/Unit: $3.97

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Trenching, Earth, 12 in. x 48 in.	53	Trenching, earth, 12 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling	Feet	$1.24	1320	$1,636.80
Fuser for HDPE Pipe	1383	Fusing machine for 1 to 12 inch diameter HDPE pipe joints. Equipment costs only. Does not include labor.	Hours	$18.30	16	$292.80
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	32	$774.08
Materials						
Pipe, HDPE, smooth wall, weight priced	1379	High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only.	Pound	$3.07	5843	$17,938.01
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 430 - Irrigation Pipeline

Scenario: #14 - Surface HDPE (Iron Pipe Size & Tubing)

Scenario Description:

Description: On-ground surface installation of HDPE (Iron Pipe Size & Tubing) pipeline. HDPE (IPS & Tubing) is manufactured in sizes (nominal diameter) from ½-inch to 24-inch; typical practice sizes range from 2-inch to 24-inch; and typical scenario size is 2-inch. Construct 1/4 mile (1,320 feet) of 2-inch, Class 200 (SDR-9.0), HDPE pipeline with appurtenances, installed on the ground surface. The unit is weight of pipe material in pounds. 1,320 feet of 2-inch, Class 200 (SDR-9.0), HDPE weighs 0.744 lb/ft, or a total of 982 pounds. Appurtenances include: fittings, air vents, pressure relief valves, anchors, thrust blocks, risers, and inline valves, and are included in the cost of pipe material (additional 15% of pipe material quantity). Cost of appurtenances does not include flow meters or backflow preventers. Typical installation applies to soils with no special bedding requirements. Resource Concerns: Inefficient Use of Irrigation Water; Inefficient Energy Use. Associated Practices: 436 - Irrigation Reservoir; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 443 - Irrigation System, Surface & Subsurface; 447 - Irrigation System, Tailwater Recovery; 533 - Pumping Plant; 634 - Waste Transfer.

Before Situation:

Pipeline needed to replace or supplement inefficient irrigation conveyance systems.

After Situation:

Pipeline installed to convey and/or distribute water to irrigation systems or reservoirs, minimizing non-beneficial water use, reducing soil erosion, and/or reducing energy use.

Feature Measure: Weight of Pipe

Scenario Unit: Pound

Scenario Typical Size: 982.0

Scenario Total Cost: $4,129.65

Scenario Cost/Unit: $4.21

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Fuser for HDPE Pipe	1383	Fusing machine for 1 to 12 inch diameter HDPE pipe joints. Equipment costs only. Does not include labor.	Hours	$18.30	8	$146.40
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	16	$387.04
Materials						
Pipe, HDPE, smooth wall, weight priced	1379	High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only.	Pound	$3.07	1129	$3,466.03
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	2	$130.18

Practice: 430 - Irrigation Pipeline

Scenario: #15 - HDPE (Corrugated Plastic Pipe)

Scenario Description:

Description: Below ground installation of HDPE (Corrugated Plastic Pipe) pipeline. HDPE (CPP) Twin-Wall is manufactured in sizes (nominal diameter) from 4-inch to 60-inch; typical practice sizes range from 12-inch to 24-inch; and typical scenario size is 18-inch. Construct 1/8 mile (660 feet) of 18-inch, Twin-Wall, HDPE Corrugated Plastic Pipe (CPP) with a smooth interior, and appurtenances, installed below ground with a minimum 2 feet of ground cover. The unit is in weight of pipe material in pounds. 660 feet of 18-inch, Twin-Wall, HDPE CPP weighs 6.40 lb/ft, or a total of 4,224 pounds. Appurtenances include: couplings, fittings, air vents, pressure relief valves, thrust blocks, risers, and inline valves, and are included in the cost of pipe material (additional 10% of pipe material quantity). Cost of appurtenances does not include flow meters or backflow preventers. Typical installation applies to soils with no special bedding requirements. Resource Concerns: Inefficient Use of Irrigation Water; Inefficient Energy Use. Associated Practices: 436 - Irrigation Reservoir; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 443 - Irrigation System, Surface & Subsurface; 447 - Irrigation System, Tailwater Recovery; 533 - Pumping Plant; 634 - Waste Transfer.

Before Situation:

Pipeline needed to replace or supplement inefficient irrigation conveyance systems.

After Situation:

Pipeline installed to convey and/or distribute water to irrigation systems or reservoirs, minimizing non-beneficial water use, reducing soil erosion, and/or reducing energy use.

Feature Measure: Weight of Pipe

Scenario Unit: Pound

Scenario Typical Size: 4,224.0

Scenario Total Cost: $18,631.12

Scenario Cost/Unit: $4.41

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Trenching, Earth, 30 in. x 48 in.	1384	Trenching, earth, 30 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling	Feet	$3.18	660	$2,098.80
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	64	$1,548.16
Materials						
Pipe, HDPE, CPT, Double Wall, Water Tight, 18 in.	2207	Pipe, Corrugated HDPE Double Wall 18 inch diameter with water tight joints meeting ASTM F477. Material cost only.	Feet	$19.99	726	$14,512.74
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 430 - Irrigation Pipeline

Scenario: #16 - Steel (Iron Pipe Size)

Scenario Description:

Description: Below ground installation of Steel (Iron Pipe Size) pipeline. Steel (IPS) is manufactured in sizes (nominal diameter) from ½-inch to 36-inch; typical practice sizes range from 2-inch to 18-inch; and typical scenario size is 6-inch. Construct 1/4 mile (1,320 feet) of 6-inch, Schedule 10, Galvanized Steel Pipe with appurtenances, installed below ground with a minimum feet of ground cover. The unit is the weight of pipe material in pounds. 1,320 feet of 6-inch, Schedule 10, Galvanized Steel Pipe weighs 9.289 lb/ft, for a total of 12, 261 pounds. Appurtenances include: couplings, fittings, air vents, pressure relief valves, thrust blocks, risers, and inline valves, and are included in the cost of pipe material (additional 10% of pipe material quantity). Typical installation applies to soils with no special bedding requirements. Resource Concerns: Inefficient Use of Irrigation Water; Inefficient Energy Use. Associated Practices: 436 - Irrigation Reservoir; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 443 - Irrigation System, Surface & Subsurface; 447 - Irrigation System, Tailwater Recovery; 533 - Pumping Plant; 634 - Waste Transfer.

Before Situation:

Pipeline needed to replace or supplement inefficient irrigation conveyance systems.

After Situation:

Pipeline installed to convey and/or distribute water to irrigation systems or reservoirs, minimizing non-beneficial water use, reducing soil erosion, and/or reducing energy use.

Feature Measure: Weight of Pipe

Scenario Unit: Pound

Scenario Typical Size: 12,261.0

Scenario Total Cost: $29,553.34

Scenario Cost/Unit: $2.41

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Trenching, Earth, 12 in. x 48 in.	53	Trenching, earth, 12 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling	Feet	$1.24	1320	$1,636.80
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	64	$1,548.16
Materials						
Pipe, steel, smooth wall, galvanized, weight priced	1381	Steel manufactured into galvanized smooth wall pipe	Pound	$1.92	13488	$25,896.96
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 430 - Irrigation Pipeline

Scenario: #17 - Steel (Corrugated Steel Pipe)

Scenario Description:

Description: Below ground installation of Corrugated Steel Pipe (CSP) pipeline. Steel (CSP) is manufactured in sizes (nominal diameter) from 12-inch to 72-inch; typical practice sizes range from 12-inch to 24-inch; and typical scenario size is 18-inch. Construct 1/8 mile (660 feet) of 18-inch, 14-gauge, Galvanized Corrugated Steel Pipe (CSP) with appurtenances, installed below ground with a minimum 2 feet of ground cover. The unit is weight of pipe material in pounds. 660 feet of 18-inch, 14-gauge, Galvanized CSP weighs 18.0 lb/ft, or a total of 11,800 pounds. Appurtenances include: couplings, fittings, air vents, pressure relief valves, thrust blocks, risers, and inline valves, and are included in the cost of pipe material (additional 10% of pipe material quantity). Cost of appurtenances does not include flow meters or backflow preventers. Typical installation applies to soils with no special bedding requirements. Resource Concerns: Inefficient Use of Irrigation Water; Inefficient Energy Use. Associated Practices: 436 - Irrigation Reservoir; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 443 - Irrigation System, Surface & Subsurface; 447 - Irrigation System, Tailwater Recovery; 533 - Pumping Plant; 634 - Waste Transfer.

Before Situation:

Pipeline needed to replace or supplement inefficient irrigation conveyance systems.

After Situation:

Pipeline installed to convey and/or distribute water to irrigation systems or reservoirs, minimizing non-beneficial water use, reducing soil erosion, and/or reducing energy use.

Feature Measure: Weight of Pipe

Scenario Unit: Pound

Scenario Typical Size: 11,880.0

Scenario Total Cost: $19,925.66

Scenario Cost/Unit: $1.68

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Trenching, Earth, 30 in. x 48 in.	1384	Trenching, earth, 30 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling	Feet	$3.18	660	$2,098.80
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	80	$1,935.20
Materials						
Pipe, CMP, 14-12 gauge, weight priced	1589	14 and 12 gauge galvanized helical corrugated metal pipe priced by the weight of the pipe materials. Materials only.	Pound	$1.18	13068	$15,420.24
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 430 - Irrigation Pipeline

Scenario: #22 - PVC PIP, Remote Location or Adverse Installation Conditions

Scenario Description:

Description: Below ground installation of PVC (Plastic Irrigation Pipe) pipeline. PVC (PIP) is manufactured in sizes (nominal diameter) from 4-inch to 27-inch; typical practice sizes range from 4-inch to 24-inch; and typical scenario size is 12-inch. Construct 1/4 mile (1,320 feet) of 12-inch, Class 50 (SDR-81.0), PVC PIP with appurtenances, installed below ground with a minimum of 2 feet of ground cover. The unit is weight of pipe in pounds. 1,320 feet of 12-inch, Class 50 (SDR-81.0) PVC PIP weighs 3.594 lb/ft, or a total of 4,744 pounds. Appurtenances include: couplings, fittings, air vents, pressure relief valves, thrust blocks, risers, and inline valves, and are included in the cost of pipe material (additional 10% of pipe material quantity). The cost of the alfalfa valve is included in the cost, this valve is not included in appurtenances. Cost of appurtenances does not include flow meters or backflow preventers. This scenario is strictly for installation of pipelines in remote locations that are at least 50 miles or more from the source of equipment or materials or for pipelines with adverse installation conditions such as trenching in excessively rocky terrain or high water tables. This scenario does not apply to pipelines requiring select backfill due to pipe size. Resource Concerns: Inefficient Use of Irrigation Water; Inefficient Energy Use. Associated Practices: 436 - Irrigation Reservoir; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 443 - Irrigation System, Surface & Subsurface; 447 - Irrigation System, Tailwater Recovery; 533 - Pumping Plant; 634 - Waste Transfer.

Before Situation:

Pipeline needed to replace or supplement inefficient irrigation conveyance systems.

After Situation:

Pipeline installed to convey and/or distribute water to irrigation systems or reservoirs, minimizing non-beneficial water use, reducing soil erosion, and/or reducing energy use.

Feature Measure: Weight of Pipe

Scenario Unit: Pound

Scenario Typical Size: 4,744.0

Scenario Total Cost: $22,215.00

Scenario Cost/Unit: $4.68

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Trenching, Earth, loam, 24 in. x 48 in.	54	Trenching, earth, loam, 24 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling	Feet	$2.58	1320	$3,405.60
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	64	$1,548.16
Materials						
Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.31	5218	$12,053.58
Valve, Alfalfa valve with riser, PVC, 14 in.	2130	Alfalfa valve assembly including, 14 inch diameter metal alfalfa valve, PVC tee, 36 inch PVC riser for connection to a pipeline. Materials only.	Each	$1,034.06	4	$4,136.24
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	600	$600.00
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 430 - Irrigation Pipeline

Scenario: #23 - Micro Hydroelectric Power Plant

Scenario Description:

Installation of a micro hydroelectric power plant concurrently with the installation of an irrigation pipeline. Energy generated from installation can be used to provide on-farm agricultural electrical power, such as to power a center pivot. Typical size of installation is 10 kilowatts. Resource Concerns: Inefficient use of Irrigation Water; Inefficient Energy Use. Associated Practices: 436- Irrigation Reservoir; 441 Irrigation System, Microirrigation; 442- Irrigation System, Sprinkler; 443- Irrigation System, Surface and Subsurface.

Before Situation:

Pipeline needed to replace or supplement existing inefficient irrigation conveyance system. Sufficient flow rate and head are available to make installation and operation of micro hydroelectric power plant feasible.

After Situation:

Irrigation pipeline installed to convey and/or distribute water to irrigation systems or reservoirs, minimizing conveyance losses, reducing soil erosion, and/or reducing energy use. Micro hydroelectric power plant is installed to generate energy to provide on-farm electrical power.

Feature Measure: Electric Power

Scenario Unit: Kilowatt

Scenario Typical Size: 10.0

Scenario Total Cost: $42,918.92

Scenario Cost/Unit: $4,291.89

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	48	$1,637.76
Materials						
Pump House, Above Ground	2470	Above ground prefabricated pump house. Includes material and shipping only.	Each	$837.50	1	$837.50
Generator, Hydroelectric	2580	A generator for a hydroelectric turbine is either a permanent magnet alternator, or a “synchronous” or induction AC generatorIncludes materials and shipping only.	Kilowatt	$999.25	10	$9,992.50
Turbine, Hydroelectric	2589	Impulse turbine generally suitable for high head, low flow applications and uses the velocity of the water to move the runner and discharges to atmospheric pressure. The water stream hits each bucket on the runner. There is no suction on the down side of the turbine, and the water flows out the bottom of the turbine housing after hitting the runner. Includes materials and shipping only.	Kilowatt	$2,137.43	10	$21,374.30
Inverter, Hydroelectric	2592	A grid-tie or grid-interactive inverter which converts the direct current (DC) power from renewable energy source into the alternating current (AC) used in homes and businesses. Includes materials and shipping only.	Kilowatt	$737.76	10	$7,377.60
Battery Bank, Hydroelectric	2593	Device used to provide a way to store surplus energy when more is being produced than consumed. When demand increases beyond what is generated, the batteries can be called on to release energy to keep household loads operating. Includes materials and shipping only.	Each	$646.82	1	$646.82
Controller, Hydroelectric	2594	Transmit excess energy to a secondary (dump) load, such as an air or water heater. Off-grid, batteryless AC-direct microhydro systems need controls too. A load–control governor monitors the voltage or frequency of the system, and keeps the generator correctly loaded, turning dump-load capacity on and off as the load pattern changes, or mechanically deflects water away from the runner. Grid-tied batteryless AC and DC systems also need controls to protect the system if the utility grid fails. Includes materials and shipping.	Each	$820.28	1	$820.28
Dump Load, Hydroelectric	2595	Electrical resistance heater that must be sized to handle the full generating capacity of the microhydro turbine. Dump loads can be air or water heaters. Excess energy is shunted to the dump load when necessary. Includes materials and shipping only.	Each	$232.16	1	$232.16

Practice: 430 - Irrigation Pipeline

Scenario: #24 - Micro Hydro-mechanical Power Plant

Scenario Description:

Installation of a micro hydro-mechanical c power plant concurrently with the installation of an irrigation pipeline. Energy generated from installation can be used to provide on-farm agricultural mechanical power, such as to power the movement of a center pivot. Typical size of installation is 5 horsepower. Resource Concerns: Inefficient use of Irrigation Water; Inefficient Energy Use. Associated Practices: 436- Irrigation Reservoir; 441 Irrigation System, Microirrigation; 442- Irrigation System, Sprinkler; 443- Irrigation System, Surface and Subsurface.

Before Situation:

Pipeline needed to replace or supplement existing inefficient irrigation conveyance system. Sufficient flow rate and head are available to make installation and operation of micro hydro-mechanical power plant feasible.

After Situation:

Irrigation pipeline installed to convey and/or distribute water to irrigation systems or reservoirs, minimizing conveyance losses, reducing soil erosion, and/or reducing energy use. Micro hydroelectric power plant is installed to generate energy to provide on-farm electrical power.

Feature Measure: Mechanical Power

Scenario Unit: Horsepower

Scenario Typical Size: 5.0

Scenario Total Cost: $8,526.79

Scenario Cost/Unit: $1,705.36

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	36	$1,228.32
Materials						
Pump, > 5 HP to 30 HP, pump and motor, fixed cost portion	1011	Fixed cost portion of a pump between 5 and 30 HP, including the pump and motor. This portion is a base cost for the pump and is not dependant on horsepower. The total cost will include this fixed cost plus a variable cost portion. Includes material and shipping only.	Each	$2,367.02	1	$2,367.02
Pump, > 5 HP to 30 HP, pump and motor, variable cost portion	1012	Variable cost portion of a pump between 5 and 30 HP, including the pump and motor. This portion is dependent on the total horsepower for the pump. The total cost will include this variable cost plus a fixed cost portion. Includes material and shipping only.	Horsepower	$186.89	5	$934.45
Generator, Hydroelectric	2580	A generator for a hydroelectric turbine is either a permanent magnet alternator, or a “synchronous” or induction AC generatorIncludes materials and shipping only.	Kilowatt	$999.25	4	$3,997.00

Practice: 436 - Irrigation Reservoir

Scenario: #1 - Embankment Dam with On-Site Borrow

Scenario Description:

The reservoir, created by an embankment built across a natural depression, with an 18" diameter principal spillway outlet through the embankment, is controlled by a canal-style gate. Outlet can also serve as overflow protection with a 12" diameter standpipe and tee to the 18" pipe. Any watershed runoff will be diverted around reservoir. It will be built with approximately 4,500 cubic yards of on-site material. It will be about 19.9 feet high and 200 feet long and hold approximately 1,000,000 gallons (3 acre-feet). The top of berm will be 10 feet wide and the embankment side slopes will be 2.5 H to 1 V up and down stream. Resource concern: Insufficient Water - Inefficient use of irrigation water. Associated practices include: 521 - Pond Sealing or Lining (various); 320 - Irrigation Canal or Lateral; 430 - Irrigation Pipeline; 428 - Irrigation Ditch Lining; 533 - Pumping Plant; 440 series - Irrigation Systems; 378 - Pond; 447 - Irrigation System, Tailwater Recovery; 484 - Mulching; and 342 - Critical Area Planting.

Before Situation:

Current system relies on an intermittent or low-flow rate water source. This results in untimely and/or inefficient water application. Divert water around - no spillway

After Situation:

This is an embankment, installed across a natural off-stream intermittent watercourse, used to store water for subsequent irrigation. It will be used to accumulate and store water for timely and efficient application of water through an irrigation system The water source could be a well, irrigation district pipeline, and/or a pump from a stream. It is designed to deliver water by gravity to an open ditch or non-pressurized pipeline, generally in excess of 5 cfs. All earthen materials will be from on-site sources.

Feature Measure: Volume of Compacted Eartfill

Scenario Unit: Cubic Yards

Scenario Typical Size: 4,500.0

Scenario Total Cost: $24,589.91

Scenario Cost/Unit: $5.46

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	4500	$18,855.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	16	$387.04
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	8	$362.72
Materials						
Pipe, HDPE, CPT, Double Wall, Soil Tight, 12 in.	1244	Pipe, Corrugated HDPE Double Wall, 12 inch diameter with soil tight joints - AASHTO M294. Material cost only.	Feet	$10.52	36	$378.72
Pipe, HDPE, CPT, Double Wall, Soil Tight, 18 in.	1245	Pipe, Corrugated HDPE Double Wall, 18 inch diameter with soil tight joints - AASHTO M294. Material cost only.	Feet	$17.41	120	$2,089.20
Screw gate, cast iron, 18 in. diameter, 10/0 head	1917	18 inch diameter cast iron screw (canal) gate rated at 10 seating head 0 feet unseating head. Materials only.	Each	$1,069.25	1	$1,069.25
Coupling, HDPE CPT Dual Wall, Tee, 18 in. x 18 in. x 12 in.	1921	Tee, 18 inch x 18 inch x 12 inch - HDPE CPT Tee. Materials only.	Each	$312.21	1	$312.21
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	2	$900.06

Practice: 436 - Irrigation Reservoir

Scenario: #2 - Embankment Dam with Off-Site Borrow

Scenario Description:

The reservoir, created by an embankment built across a natural depression, with an 18" diameter principal spillway through the embankment, is controlled by a canal-style gate. It will be built with approximately 4,500 cubic yards of material from off the site. It will be about 19.9 feet high and 200 feet long and hold approximately 1,000,000 gallons (3 Ac-Ft.). The top of berm will be 10 feet wide and the embankment side slopes will be 2.5 H to 1 V up and down stream. Resource concern: Insufficient Water - Inefficient use of irrigation water. Associated Practices: 521 - Pond Sealing or Lining (various); 320 - Irrigation Canal or Lateral; 430 - Irrigation Pipeline; 428 - Irrigation Ditch Lining; 533 - Pumping Plant; 440 series - Irrigation Systems; 447 - Irrigation System, Tailwater Recovery; 378 - Pond; 484 - Mulching; and 342 - Critical Area Planting.

Before Situation:

Current system relies on an intermittent or low-flow rate water source. This results in untimely and/or inefficient water application.

After Situation:

This is an embankment, installed across a natural off-stream intermittent watercourse, used to store water for subsequent irrigation. It will be used to accumulate and store water for timely and efficient application of water through an irrigation system The water source could be, a well, irrigation district pipeline, and/or a pump from a stream. It is designed to deliver water by gravity to an open ditch or non-pressurized pipeline, generally in excess of 5 cfs. All earthen materials will be from off-site sources.

Feature Measure: Volume of Compacted Eartfill

Scenario Unit: Cubic Yards

Scenario Typical Size: 4,500.0

Scenario Total Cost: $38,489.33

Scenario Cost/Unit: $8.55

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	5850	$12,168.00
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	4500	$18,855.00
Hauling, bulk, highway truck	1615	Hauling of bulk earthfill, rockfill, waste or debris. One-way travel distance using fully loaded highway dump trucks (typically 16 CY or 20 TN capacity). Includes equipment and labor for truck only. Does not include cost for loading truck.	Cubic Yard Mile	$0.28	4500	$1,260.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	16	$387.04
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	8	$362.72
Materials						
Pipe, HDPE, CPT, Double Wall, Soil Tight, 12 in.	1244	Pipe, Corrugated HDPE Double Wall, 12 inch diameter with soil tight joints - AASHTO M294. Material cost only.	Feet	$10.52	36	$378.72
Pipe, HDPE, CPT, Double Wall, Soil Tight, 18 in.	1245	Pipe, Corrugated HDPE Double Wall, 18 inch diameter with soil tight joints - AASHTO M294. Material cost only.	Feet	$17.41	120	$2,089.20
Screw gate, cast iron, 18 in. diameter, 10/0 head	1917	18 inch diameter cast iron screw (canal) gate rated at 10 seating head 0 feet unseating head. Materials only.	Each	$1,069.25	1	$1,069.25
Coupling, HDPE CPT Dual Wall, Tee, 18 in. x 18 in. x 12 in.	1921	Tee, 18 inch x 18 inch x 12 inch - HDPE CPT Tee. Materials only.	Each	$312.21	1	$312.21
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	3	$707.13
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	2	$900.06

Practice: 436 - Irrigation Reservoir

Scenario: #3 - Embankment Reservoir <= 30 Acre-Feet

Scenario Description:

This is a small rectangular embankment reservoir with a 10" diameter principal spillway through the embankment controlled by a canal-type gate. It is designed to accumulate, store, and deliver water by gravity to an open ditch or non-pressurized pipeline, in excess of 5 cfs. It will have an inside dimension of about 375 feet square, with 12 feet of fill and about 1600 feet total length of embankment (along the centerline). The embankment top will be 10 feet wide and the side slopes will no steeper than 2.5 H to 1 V inside and out. It will be built with approximately 28,500 cubic yards of on-site material. It will have a maximum water depth of 10 feet with 2 feet of freeboard and no auxiliary spillway. Volume is approximately 30 ac-ft (10,000,000 gallons). Resource Concern: Insufficient Water - Inefficient use of irrigation water. Associated Practices: 521 - Pond Sealing or Lining (various); 320 - Irrigation Canal or Lateral; 430 - Irrigation Pipeline; 428 - Irrigation Ditch Lining; 533 - Pumping Plant; 440 series - Irrigation Systems; 447 - Irrigation System, Tailwater Recovery; 378 - Pond; 484 - Mulching; and 342 - Critical Area Planting.

Before Situation:

Current system relies on an intermittent or low-flow rate water source. This results in untimely and/or inefficient water application.

After Situation:

The square reservoir will be built on a relatively flat site and be used to accumulate and store water for timely application through an irrigation system. The water source could be a stream, an irrigation well, or an irrigation district canal.

Feature Measure: Volume of Compacted Earthfill

Scenario Unit: Cubic Yards

Scenario Typical Size: 28,500.0

Scenario Total Cost: $124,430.54

Scenario Cost/Unit: $4.37

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	28500	$119,415.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	16	$387.04
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	8	$362.72
Materials						
Pipe, HDPE, CPT, Double Wall, Soil Tight, 10 in.	1243	Pipe, Corrugated HDPE Double Wall, 10 inch diameter with soil tight joints - AASHTO M252. Material cost only.	Feet	$7.46	100	$746.00
Screw gate, cast iron, 10 in. diameter, 10/0 head	1916	10 inch diameter cast iron screw (canal) gate rated at 10 seating head 0 feet unseating head. Materials only.	Each	$766.70	1	$766.70
Catwalk, metal	1918	Metal pedestrian walk way giving access to the valve on a structure, typically 3' wide with railing. Materials only.	Feet	$69.08	20	$1,381.60
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	2	$900.06

Practice: 436 - Irrigation Reservoir

Scenario: #4 - Embankment Reservoir > 30 Acre-Feet

Scenario Description:

This is a very large embankment reservoir with a 18" diameter drain pipe through the embankment controlled by a canal-type gate. It is designed to accumulate, store, and deliver water by gravity to an open ditch or non-pressurized pipeline, in excess of 5 cfs. It will have a top width of 12ft and centerline length of embankment of 5,280 feet. Average fill of 10 feet and the side slopes will be no steeper than 3 H to 1 V inside and out. It will be built with approximately 105,000 cubic yards of on-site material. It will have a maximum water depth of 8 feet with 2 feet of freeboard and no auxiliary spillway. Volume is approximately 320 ac-ft (104,500,000 gallons). Critical Area Planting and Mulching is required. Resource Concern: Insufficient Water - Inefficient use of irrigation water. Associated Practices: 521 - Pond Sealing or Lining (various); 320 - Irrigation Canal or Lateral; 430 - Irrigation Pipeline; 428 - Irrigation Ditch Lining; 533 - Pumping Plant; 440 series - Irrigation Systems; 447 - Irrigation System, Tailwater Recovery; 378 - Pond; 484 - Mulching; and 342 - Critical Area Planting.

Before Situation:

Current system relies on an intermittent or low-flow rate water source. This results in untimely and/or inefficient water application.

After Situation:

The rectangular reservoir will be built on a relatively flat site and be used to accumulate and store water for timely application through an irrigation system. The water source could be a stream or an irrigation district canal.

Feature Measure: Volume of Compacted Earthfill

Scenario Unit: Cubic Yards

Scenario Typical Size: 104,200.0

Scenario Total Cost: $459,160.28

Scenario Cost/Unit: $4.41

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	104200	$436,598.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	32	$774.08
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	16	$725.44
Materials						
Pipe, Steel, 18 in., Std Wt	1366	Materials: - 18 inch - Steel Std Wt	Feet	$147.18	100	$14,718.00
Screw gate, cast iron, 18 in. diameter, 10/0 head	1917	18 inch diameter cast iron screw (canal) gate rated at 10 seating head 0 feet unseating head. Materials only.	Each	$1,069.25	1	$1,069.25
Catwalk, metal	1918	Metal pedestrian walk way giving access to the valve on a structure, typically 3' wide with railing. Materials only.	Feet	$69.08	50	$3,454.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	3	$1,350.09

Practice: 436 - Irrigation Reservoir

Scenario: #5 - Excavated Tailwater Pit

Scenario Description:

This is an excavated pit with a control structure. It is designed to accumulate, store, deliver or regulate water for a surface irrigation system. It will have a bottom width of 20 ft and length of 1,250 feet. The side slopes will be no steeper than 1.5 H to 1 V inside and out. It will be built with approximately 20,000 cubic yards of on-site material. It will have a maximum water depth of 10 feet with 1 feet of freeboard. Volume is approximately 12 ac-ft (3,950,303 gallons). Resource concern: Insufficient Water - Inefficient use of irrigation water. Associated Practices: 521 - Pond Sealing or Lining (various); 320 - Irrigation Canal or Lateral; 430 - Irrigation Pipeline; 428 - Irrigation Ditch Lining; 533 - Pumping Plant; 440 series - Irrigation Systems; 447 - Irrigation System, Tailwater Recovery; 378 - Pond; 484 - Mulching; and 342 - Critical Area Planting.

Before Situation:

Current system relies on an intermittent or low-flow rate water source. This results in untimely and/or inefficient water application.

After Situation:

An excavated regulating reservoir will be built on a relatively flat site and be used to accumulate and store water for timely application through an irrigation system. The water source could be a stream or an irrigation district canal.

Feature Measure: Volume of Earth Excavated

Scenario Unit: Cubic Yards

Scenario Typical Size: 19,600.0

Scenario Total Cost: $42,278.65

Scenario Cost/Unit: $2.16

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	19600	$40,768.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	8	$193.52
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	4	$181.36
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	2	$900.06

Practice: 436 - Irrigation Reservoir

Scenario: #6 - Steel Tank

Scenario Description:

A 20,000 Gallon, above ground, enclosed fabricated Steel or bottomless Corrugated Metal (with plastic liner and cover) tank with fittings, is installed on 6" of well compacted drain rock support pad with sand padding (CM tank), to store water from a reliable source for irrigation of an area less than 5 acres. The scenario assumes the typical dimensions of the tank are 24 feet in diameter and 6 feet tall. The scenario also assumes a 28 feet diameter gravel base pad to extend a minimum of 2 feet past the base of tank for adequate foundation support. This cost estimate scenario is for cost of the tank and pad only and does not include the cost for pumps, pipe, or fittings for the pipeline. Resource Concern: Insufficient Water - Inefficient use of irrigation water. Associated Practices: 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 533 - Pumping Plant; 447 - Irrigation System, Tailwater Recovery.

Before Situation:

Insufficient volume of water to complete an irrigation cycle at the required flow rate.

After Situation:

An above ground, enclosed fabricated steel or bottomless corrugated metal tank (with plastic liner and cover), capable of withstanding the elements, is used to accumulate and store water between irrigation cycles for a small irrigation system. This allows for an improved flow rate and timing of water application. Sources of water could be a well, a domestic water system, a very large roof area, a water ram , or a pump drawing water from a stream.

Feature Measure: Volume of Tank Storage

Scenario Unit: Gallons

Scenario Typical Size: 20,000.0

Scenario Total Cost: $16,363.08

Scenario Cost/Unit: $0.82

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.72	10	$507.20
Plate compactor	1915	Manually guided vibratroy plate compactor. Equipment only.	Hours	$3.99	16	$63.84
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	80	$1,935.20
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	16	$538.24
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	40	$1,813.60
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic Yards	$28.74	8	$229.92
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic Yards	$22.79	12	$273.48
Tank, Corrugated Metal Storage, 20,000 gallon	1920	20,000 gallon capacity enclosed corrugated Metal Storage tank. Includes delivery to the site and anchoring material.	Each	$10,400.00	1	$10,400.00
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	2	$130.18
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 436 - Irrigation Reservoir

Scenario: #7 - Plastic Tank

Scenario Description:

A 3,000 Gallon, above-ground, High Density Polyethylene plastic enclosed tank, is installed on 6" of well-compacted drain rock or a 4" thick reinforced concrete support pad, to store water from a reliable source for irrigation of an area less than one acre. The scenario assumes the typical dimensions of the tank are 102" in diameter and 93" tall. The scenario also assumes a 126" diameter gravel base or concrete pad to extend a minimum of 12" past the base of tank for adequate foundation support. This cost estimate scenario is for cost of the tank and pad only and does not include estimate for pumps, pipe, or connecting fittings. Resource Concern: Insufficient Water - Inefficient use of irrigation water. Associated Practices: 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 533 - Pumping Plant; 447 - Irrigation System, Tailwater Recovery.

Before Situation:

Insufficient volume of water to complete an irrigation cycle at the required flow rate.

After Situation:

An above-ground plastic tank, constructed to withstand the elements, is used to accumulate and store water between irrigation cycles for a very small irrigation system. This allows for an improved flow rate and timing of water application. Sources of water could be a well, a domestic water system, a large roof area, a water ram , or a pump drawing water from a stream.

Feature Measure: Volume of Tank Storage

Scenario Unit: Gallons

Scenario Typical Size: 3,000.0

Scenario Total Cost: $5,068.82

Scenario Cost/Unit: $1.69

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.72	6	$304.32
Plate compactor	1915	Manually guided vibratroy plate compactor. Equipment only.	Hours	$3.99	4	$15.96
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	32	$774.08
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	6	$201.84
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	16	$725.44
Materials						
Tank, Poly Enclosed Storage, >1,000	1075	Water storage tanks. Includes materials and shipping only.	Gallons	$0.80	3000	$2,400.00
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic Yards	$22.79	2	$45.58
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	2	$130.18
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 436 - Irrigation Reservoir

Scenario: #8 - Fiberglass Tank

Scenario Description:

A 10,000 Gallon above ground, enclosed, fiberglass tank, is installed on 6" of well compacted drain rock support pad. The tank is used to store water from a reliable source for irrigation of areas less than 3 acres. The scenario assumes the typical dimensions of the tank are 15 feet in diameter and 8 feet tall. The scenario also assumes a 19 feet diameter gravel base pad to extend a minimum of 2 feet past the base of tank for adequate foundation support. This cost estimate scenario is for cost of the tank and pad only and does not include estimate for pumps, pipe, fittings for the pipeline, or catchment area. Resource Concern: Insufficient Water - Inefficient use of irrigation water. Associated Practices: 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 533 - Pumping Plant; 447 - Irrigation System, Tailwater Recovery.

Before Situation:

Insufficient volume of water to complete an irrigation cycle at the required flow rate.

After Situation:

A large fiberglass enclosed tank, capable of withstanding the elements, is used to accumulate and store water between irrigation cycles for a very small irrigation system. This allows for an improved flow rate and timing of water application and better efficiency. Sources of water could be a well, a domestic water system, a very large roof area, a water ram , or a pump drawing water from a stream.

Feature Measure: Volume of Tank Storage

Scenario Unit: Gallons

Scenario Typical Size: 10,000.0

Scenario Total Cost: $12,370.60

Scenario Cost/Unit: $1.24

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.72	8	$405.76
Plate compactor	1915	Manually guided vibratroy plate compactor. Equipment only.	Hours	$3.99	4	$15.96
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	40	$967.60
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	8	$269.12
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	24	$1,088.16
Materials						
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic Yards	$22.79	6	$136.74
Tank, Fiberglass Enclosed Storage, 10,000 gallon	1919	10,000 gallon capacity enclosed fiberglass water storage tank. Includes tank anchoring materials and delivery.	Each	$8,885.66	1	$8,885.66
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	2	$130.18
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 436 - Irrigation Reservoir

Scenario: #9 - Reservoir < 15 ac-ft

Scenario Description:

Relatively smaller irrigation reservoir constructed such that the capacity is obtained from both excavation and embankment material. Single pipe conduit for outflow consisting of an 18" diameter pipe to control up to 4 cfs. Excavated material is used to construct an embankment surrounding the excavation in which both retain irrigation water. Embankment is compacted with a minimum of two passes of construction equipment and the final 6-8 inches is roller compacted to reduce seepage losses. No auxiliary spillway.

Before Situation:

Irrigated cropland/hayland and some pasture with river, stream or ditch water source. Current system relies on an intermittent or low-flow rate water source. This results in untimely and/or inefficient water application.

After Situation:

A dependable water source or more efficient delivery for an improved irrigation system.

Feature Measure: Excavated Volume

Scenario Unit: Cubic Yards

Scenario Typical Size: 10,000.0

Scenario Total Cost: $31,594.50

Scenario Cost/Unit: $3.16

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	3000	$12,570.00
Excavation, common earth, large equipment, 50 ft	1222	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yards	$1.54	10000	$15,400.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	8	$193.52
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	4	$181.36
Materials						
Pipe, HDPE, CPT, Double Wall, Soil Tight, 18 in.	1245	Pipe, Corrugated HDPE Double Wall, 18 inch diameter with soil tight joints - AASHTO M294. Material cost only.	Feet	$17.41	60	$1,044.60
Screw gate, cast iron, 18 in. diameter, 10/0 head	1917	18 inch diameter cast iron screw (canal) gate rated at 10 seating head 0 feet unseating head. Materials only.	Each	$1,069.25	1	$1,069.25
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	2	$900.06

Practice: 441 - Irrigation System, Microirrigation

Scenario: #1 - SDI (Subsurface Drip Irrigation)

Scenario Description:

A subsurface drip irrigation system (SDI) with a lateral spacing between 37-59 inches. This buried drip irrigation system utilizes a thinwall dripperline or tape with inline emitters at a uniform spacing for the system laterals. The dripperline or tape is normally installed by being plowed in approx 10-14 inches deep with a chisel shank type plow equipped with tape reels. This type of drip irrigation system utilizes a buried supply manifold with automated zone control valves and a buried flush manifold with manual flush valves. This permanent micro-irrigation system includes an automated filter station, flow meter, backflow prevention device, automated control box or timer, the thinwall dipperline or tape for laterals, both a supply and a flushing manifold and numerous types of water control valves. This is an all-inclusive system starting with the filter station including all required system components out to the flush valves. Does not include Pump, Power source, Water source (well or reservoir), Flow meter.The water supply line from the water source to the filter station is an irrigation pipeline (430) and is not included as part of this system Resource Concerns: Insufficient Water - Inefficient use of irrigation water, Degraded Plant Condition - Undesirable plant productivity and health, Water Quality Degradation - Excessive sediment in surface waters, and Inefficient Energy Use - Equipment and facilities. Associated Practices: 533-Pumping Plant, 449- Irrigation Water Management, 430 - Irrigation Pipeline, 433 - Irrigation Flow Measrement, 587-Structure for Water Control, 610 - Salinity & Sodic Soil Management, 434 - Soil Moisture Measurement, 328-Conservation Crop Rotation, and 590 Nutrient Management.

Before Situation:

Typical before irrigation situation would normally be an existing inefficient surface or sprinkler irrigation system on a cropland or hayland field. The existing irrigation system would experience poor, non-uniform irrigation applications and significant water losses affecting both water quantity and water quality

After Situation:

A typical practice would be the installation of a subsurface drip irrigation system (SDI) on a 60 acre cropland or hayland field. The system lateral (thinwall dripperline or tape) spacing would 40 inches. This highly efficient SDI (buried) irrigation system provides irrigation water directly to the plant root zone eliminating application losses resulting in a very high water application efficiency and properly designed these SDI systems are capable of very uniform water applications. Typical field size is 60 acres.

Feature Measure: Acres in System

Scenario Unit: Acres

Scenario Typical Size: 60.0

Scenario Total Cost: $135,344.33

Scenario Cost/Unit: $2,255.74

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Trenching, Pipeline Plowing	1096	Includes equipment and labor for plowing small diameter lines in common earth (< 3")	Feet	$0.99	6800	$6,732.00
Micro Irrigation, chemical injection equipment	1987	Chemical Injector Pump, plus chemigation check valve, injector ports, and appurtenances, Installation included.	Each	$1,813.43	1	$1,813.43
Materials						
Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.31	4800	$11,088.00
Micro Irrigation, Media Filter, 30 to 48 in. Dia. tank, Equipped for Automatic Flush	1482	Sand or media filter for Micro irrigation system. Includes plumbing, connections and automatic controller. Unit is complete and installed. Unit price per filter, not per filter station.	Each	$5,240.71	3	$15,722.13
Micro Irrigation, screen filter, => 100 gpm	1484	Screen filter for Micro irrigation system with 100 gpm or greater capacity. Includes plumbing, connections and automatic controller. Unit is complete and installed. Unit price per filter, not per filter station.	Each	$794.25	1	$794.25
Micro Irrigation, control valves and timers	1485	Automatic controller and timer, to turn on and off the sets for micro irrigation, installation and valves. Based on control unit, not number of valves controlled.	Each	$400.44	1	$400.44
Micro Irrigation, buried drip tape	2521	Tape that is installed underground for sub-surface drip irrigation, includes installation, and connections to the supply and flushing laterals. Tape is a minimum of 10 mil thick thick and has emitters built in. Includes labor and installtion.	Feet	$0.12	823284	$98,794.08

Practice: 441 - Irrigation System, Microirrigation

Scenario: #2 - Surface PE with emitters

Scenario Description:

A micro-irrigation system, utilizing surface PE tubing (can be placed on trelis or above ground) with emitters to provide irrigation for an orchard, vinyard, or other specialty crop grown in a grid pattern. The typical system is a permanent system, installed on a 60 acre vineyard on the ground surface or trellis. The vineyard has a plant spacing of 8 feet x 9 feet. Laterals are spaced 9 feet apart.This system utilizes emitters at each tree or plant as the water application device. This system typically includes a filter system, PE tubing laterals, PVC manifolds, and submains, valves, fittings, emitters, etc. This practice applies to systems designed to discharge < 60 gal/hr at each individual lateral discharge point. Does not include Pump, Power source, Water source (well or reservoir), Flow meter. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, Degraded Plant Condition - Undesirable plant productivity and health, Water Quality Degradation - Excessive sediment in surface waters, and Inefficient Energy Use - Equipment and facilities. Associated Practices: 533-Pumping Plant, 449- Irrigation Water Management, 430 - Irrigation Pipeline, 433 - Irrigation Flow Measrement, 587-Structure for Water Control, 610 - Salinity & Sodic Soil Management, 434 - Soil Moisture Measurement, 328-Conservation Crop Rotation, and 590 Nutrient Management.

Before Situation:

A vineyard has an inefficient surface flood irrigation system causing irrigation water loss that impacts water quality and water quantity.

After Situation:

A surface placed microirrigation system is utilized to provide highly efficient irrigation to an vineyard. Water applications are reduced and runoff eliminated. Offsite water quality is improved, and on site water use is reduced.

Feature Measure: Acres in System

Scenario Unit: Acres

Scenario Typical Size: 60.0

Scenario Total Cost: $68,494.25

Scenario Cost/Unit: $1,141.57

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Trenching, Pipeline Plowing	1096	Includes equipment and labor for plowing small diameter lines in common earth (< 3")	Feet	$0.99	6800	$6,732.00
Micro Irrigation, chemical injection equipment	1987	Chemical Injector Pump, plus chemigation check valve, injector ports, and appurtenances, Installation included.	Each	$1,813.43	1	$1,813.43
Materials						
Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.31	4800	$11,088.00
Micro Irrigation, Media Filter, 30 to 48 in. Dia. tank, Equipped for Automatic Flush	1482	Sand or media filter for Micro irrigation system. Includes plumbing, connections and automatic controller. Unit is complete and installed. Unit price per filter, not per filter station.	Each	$5,240.71	3	$15,722.13
Micro Irrigation, screen filter, => 100 gpm	1484	Screen filter for Micro irrigation system with 100 gpm or greater capacity. Includes plumbing, connections and automatic controller. Unit is complete and installed. Unit price per filter, not per filter station.	Each	$794.25	1	$794.25
Micro Irrigation, control valves and timers	1485	Automatic controller and timer, to turn on and off the sets for micro irrigation, installation and valves. Based on control unit, not number of valves controlled.	Each	$400.44	1	$400.44
Micro Irrigation, surface drip tape	2522	Tape is installed above ground for surface drip irrigation on annual crops, includes installation, and connections to the supply and flushing laterals. Tape is a minimum of 10 mil thick and has emitters built in.	Feet	$0.10	319440	$31,944.00

Practice: 441 - Irrigation System, Microirrigation

Scenario: #3 - Microjet

Scenario Description:

A micro-irrigation system, utilizing micro-jets to provide irrigation and\or frost protection for an orchard or other specialty crops grown in a grid pattern. The system is installed with all fittings, control valves, pressure reducing/regulating valves, air/vacuum release, sand media/screen/disc filters, pressure gauges, submains (subsurface), lateral lines (subsurface), and micro-jet sprayers to deliver water to the trees. This practice applies to systems designed to discharge < 60 gal/hr at each individual lateral discharge point. Does not include Pump, Power source, Water source (well or reservoir), Flow meter.. The typical installation is a permanent, microjet -irrigation system installed on a 60 acre orchard. Typical tree spacing is 20' x 20 feet. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, Degraded Plant Condition - Undesirable plant productivity and health, Water Quality Degradation - Excessive sediment in surface waters, and Inefficient Energy Use - Equipment and facilities. Associated Practices: 533-Pumping Plant, 449- Irrigation Water Management, 430 - Irrigation Pipeline, 433 - Irrigation Flow Measrement, 587-Structure for Water Control, 610 - Salinity & Sodic Soil Management, 434 - Soil Moisture Measurement, 328-Conservation Crop Rotation, and 590 Nutrient Management.

Before Situation:

An orchard has an inefficient irrigation system causing irrigation water loss that impacts water quality and water quantity.

After Situation:

A micro-spray microirrigation system is utilized to provide highly efficient irrigation to an orchard. Water applications are reduced and runoff eliminated. Offsite water quality is improved, and on site water use is reduced.

Feature Measure: Acres in System

Scenario Unit: Acres

Scenario Typical Size: 60.0

Scenario Total Cost: $186,048.17

Scenario Cost/Unit: $3,100.80

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Trenching, Pipeline Plowing	1096	Includes equipment and labor for plowing small diameter lines in common earth (< 3")	Feet	$0.99	6800	$6,732.00
Micro Irrigation, chemical injection equipment	1987	Chemical Injector Pump, plus chemigation check valve, injector ports, and appurtenances, Installation included.	Each	$1,813.43	1	$1,813.43
Materials						
Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.31	4800	$11,088.00
Micro Irrigation, Media Filter, 30 to 48 in. Dia. tank, Equipped for Automatic Flush	1482	Sand or media filter for Micro irrigation system. Includes plumbing, connections and automatic controller. Unit is complete and installed. Unit price per filter, not per filter station.	Each	$5,240.71	3	$15,722.13
Micro Irrigation, screen filter, => 100 gpm	1484	Screen filter for Micro irrigation system with 100 gpm or greater capacity. Includes plumbing, connections and automatic controller. Unit is complete and installed. Unit price per filter, not per filter station.	Each	$794.25	1	$794.25
Micro Irrigation, control valves and timers	1485	Automatic controller and timer, to turn on and off the sets for micro irrigation, installation and valves. Based on control unit, not number of valves controlled.	Each	$400.44	1	$400.44
Micro Irrigation, emitters or sprays and tubing	1489	Emitters or sprays that are installed above ground for micro or drip irrigation. Includes installation and connections to the supply and flushing laterals. Tubing for the emitters is included in this item.	Feet	$1.04	143748	$149,497.92

Practice: 441 - Irrigation System, Microirrigation

Scenario: #4 - Small Farm

Scenario Description:

A micro-irrigation system, utilizing surface PE tubing (can be placed on trelis or above ground) with emitters to provide irrigation on small acreages that have an orchard, vinyard, or a specialty row crop. The typical system is a permanent system, installed on 5 acres or less growing speciality row crops on 38 inch row spacing. Laterals are spaced 38 inches apart. This system scenario utilizes above ground micro or drip irrigation tubing with emitters built in. PVC pipe (mainline, submains, etc) are buried. This system typically includes a filter system, PE tubing laterals, PVC manifolds, and submains, valves, fittings, emitters, flow meter, backflow prevention device, etc. This practice applies to systems designed to discharge < 60 gal/hr at each individual lateral discharge point. Does not include Pump, Power source, Water source (well or reservoir) Flow meter. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, Degraded Plant Condition - Undesirable plant productivity and health, Water Quality Degradation - Excessive sediment in surface waters, and Inefficient Energy Use - Equipment and facilities. Associated Practices: 533-Pumping Plant, 449-Irrigation Water Management, 430 - Irrigation Pipeline, 433 - Irrigation Flow Measrement, 587 - Structure for Water Control, 610 - Salinity & Sodic Soil Management, 434 - Soil Moisture Measurement, 328-Conservation Crop Rotation, and 590 Nutrient Management.

Before Situation:

A small farm (5 acres or less) has an inefficient surface flood irrigation system causing irrigation water loss that impacts water quality and water quantity.

After Situation:

A surface placed microirrigation system is utilized to provide highly efficient irrigation to a small farm. Water applications are reduced and runoff eliminated. Offsite water quality is improved, and on site water use is reduced.

Feature Measure: Acres in System

Scenario Unit: Acres

Scenario Typical Size: 5.0

Scenario Total Cost: $7,011.19

Scenario Cost/Unit: $1,402.24

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Trenching, Pipeline Plowing	1096	Includes equipment and labor for plowing small diameter lines in common earth (< 3")	Feet	$0.99	567	$561.33
Materials						
Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.31	400	$924.00
Micro Irrigation, control valves and timers	1485	Automatic controller and timer, to turn on and off the sets for micro irrigation, installation and valves. Based on control unit, not number of valves controlled.	Each	$400.44	1	$400.44
Micro Irrigation, screen filter, < 100 gpm	1617	Screen filter for Micro Irrigation used in small systems. Includes filter. No controls are included or needed.	Each	$87.02	1	$87.02
Micro Irrigation, surface drip tape	2522	Tape is installed above ground for surface drip irrigation on annual crops, includes installation, and connections to the supply and flushing laterals. Tape is a minimum of 10 mil thick and has emitters built in.	Feet	$0.10	50384	$5,038.40

Practice: 441 - Irrigation System, Microirrigation

Scenario: #5 - Windbreak Surface PE

Scenario Description:

A micro-irrigation system, utilizing surface PE tubing for the establishment of linear vegetation such as a windbreak, hedgerow, shelterbelt, or field border. The typical system is a permanent system, installed on a 3 row 1000' windbreak on the ground surface (total of 3000' lf). The windbreak has a tree or plant spacing of 8 feet, and a 15 ft lateral spacing. This system utilizes emitters at each tree or plant as the water application device. This system typically includes a filter system, PE tubing, emitters, etc. This practice applies to systems designed to discharge < 60 gal/hr at each individual lateral discharge point. Does not include Pump, Power source, Water source (well or reservoir),Flow meter. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, Degraded Plant Condition - Undesirable plant productivity and health, Water Quality Degradation - Excessive sediment in surface waters, and Inefficient Energy Use - Equipment and facilities. Associated Practices: 380-Windbreak/Shelterbelt Establishment, 533-Pumping Plant, 449- Irrigation Water Management, 430 - Irrigation Pipeline, 433 - Irrigation Flow Measrement, 587 - Structure for Water Control, 610 - Salinity & Sodic Soil Management, 434 - Soil Moisture Measurement, 328-Conservation Crop Rotation, and 590 Nutrient Management.

Before Situation:

A tree row has an insufficient available water source causing plant health (establishement and persistence) concerns.

After Situation:

A surface placed microirrigation system is utilized to provide highly efficient irrigation to a tree row to address plant health concerns.

Feature Measure: Acre of Windbreak

Scenario Unit: Acres

Scenario Typical Size: 1.0

Scenario Total Cost: $1,047.02

Scenario Cost/Unit: $1,047.02

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Materials						
Micro Irrigation, surface drip tubing	1488	Tubing is installed above ground for surface drip irrigation, includes installation, and connections to the supply and flushing laterals. Tubing has emitters built in.	Feet	$0.32	3000	$960.00
Micro Irrigation, screen filter, < 100 gpm	1617	Screen filter for Micro Irrigation used in small systems. Includes filter. No controls are included or needed.	Each	$87.02	1	$87.02

Practice: 441 - Irrigation System, Microirrigation

Scenario: #6 - Hoop House Surface Microirrigation

Scenario Description:

Surface Microirrigation system for 30' x 96' seasonal high tunnel, 24" rows with emmitters on a 12" spacing. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, Degraded Plant Condition - Undesirable plant productivity and health, Water Quality Degradation - Excessive sediment in surface waters, and Inefficient Energy Use - Equipment and facilities. Associated Practices: 533-Pumping Plant, 449- Irrigation Water Management, 430 - Irrigation Pipeline, 433 - Irrigation Flow Measrement, 328-Conservation Crop Rotation, 587 - Structure for Water Control, and 590 Nutrient Management.

Before Situation:

An enclosed field has an inefficient garden-hose based sprinkler irrigation system causing irrigation water loss that impacts water quality and water quantity.

After Situation:

A surface placed microirrigation system is utilized to provide highly efficient irrigation to an area. Water applications are reduced and runoff eliminated. Offsite water quality is improved, and on site water use is reduced.

Feature Measure: Microirrigation area

Scenario Unit: Square Feet

Scenario Typical Size: 2,880.0

Scenario Total Cost: $586.60

Scenario Cost/Unit: $0.20

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	4	$96.76
Materials						
Micro Irrigation, screen filter, < 100 gpm	1617	Screen filter for Micro Irrigation used in small systems. Includes filter. No controls are included or needed.	Each	$87.02	1	$87.02
Micro Irrigation, drip irrigation system, small scale	2170	An above ground, small scale, micro-irrigation system. Includes miniature emitters, tubes, or applicators placed along a water delivery line. Includes materials and shipping only.	Square Feet	$0.07	2880	$201.60
Micro Irrigation, screen or disc filter, < 3"	2524	Micro Irrigation, small manual flush screen or disc filter, <3 inch nominal size. Includes materials only.	Each	$201.22	1	$201.22

Practice: 441 - Irrigation System, Microirrigation

Scenario: #24 - SDI (Subsurface Drip Irrigation) Existing Filter Station

Scenario Description:

A subsurface drip irrigation system (SDI) with a lateral spacing between 37-59 inches. This buried drip irrigation system utilizes a thin wall dripper line or tape with inline emitters at a uniform spacing of the system laterals. The dripper line or tape is normally installed by being plowed in approx. 10-14 inches deep with a chisel shank type plow equipped with tape reels. This type of drip irrigation system utilizes a buried supply manifold with automated zone control valves and a buried flush manifold with manual flush valves. This permanent micro-irrigation system DOES NOT include an automated filter system, flow meter, backflow prevention device, or automated control box or timer. These components already exist, and will function properly and meet NRCS criteria with the additional acreage. It DOES include thin wall dripper line or tape for laterals, both a supply and a flushing manifold and numerous types of water control valves. This system excludes a filter station, but includes all other components out to the flush valves. Does not include Pump, Power source, Water source (well or reservoir), Flow meter. The water supply line from the water source to the existing filter station is an irrigation pipeline (430) and is not included as part of this system. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, Degraded Plant Condition -Undesirable plant productivity and health, Water Quality Degradation -Excessive sediment in surface waters, and Inefficient Energy Use -Equipment and facilities. Associated Practices: 533 -Pumping Plant, 449 -Irrigation Water Management, 430- Irrigation Pipeline, 433 -Irrigation Flow Measurement, 587-Structure For Water Control, 610-Salinity & Sodic Soil Management, 434-Soil Moisture Measurement, 328- Conservation Crop Rotation, and 590 -Nutrient Management.

Before Situation:

Typical before irrigation situation would normally be an existing inefficient surface or sprinkler irrigation system on a cropland or hayland field. The existing irrigation system would experience poor, non-uniform irrigation applications and significant water losses affecting water quantity and water quality.

After Situation:

A typical practice would be the installation of a subsurface drip irrigation system (SDI) on a 60 acre cropland or hayland field. The system lateral (thin wall dripper line or tape) spacing would be 40 inches. This highly efficient SDI (buried) irrigation system provides irrigation water directly to the plant root zone eliminating application losses resulting in a very high water application efficiency and properly designed, these SDI systems are capable of very uniform water applications. Typical field size is 60 acres.

Feature Measure: Acres in System

Scenario Unit: Acres

Scenario Typical Size: 60.0

Scenario Total Cost: $117,014.52

Scenario Cost/Unit: $1,950.24

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Trenching, Pipeline Plowing	1096	Includes equipment and labor for plowing small diameter lines in common earth (< 3")	Feet	$0.99	6800	$6,732.00
Materials						
Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.31	4800	$11,088.00
Micro Irrigation, control valves and timers	1485	Automatic controller and timer, to turn on and off the sets for micro irrigation, installation and valves. Based on control unit, not number of valves controlled.	Each	$400.44	1	$400.44
Micro Irrigation, buried drip tape	2521	Tape that is installed underground for sub-surface drip irrigation, includes installation, and connections to the supply and flushing laterals. Tape is a minimum of 10 mil thick thick and has emitters built in. Includes labor and installtion.	Feet	$0.12	823284	$98,794.08

Practice: 442 - Sprinkler System

Scenario: #2 - Center Pivot, poly lined

Scenario Description:

Installation of a low pressure center pivot system. Irrigation water quality is such that normal galvanized steel will deteriorate before meeting the life expectancy of this practice. Resource concerns include: Soil Erosion (Concentrated flow erosion e.g. irrigation induced), Insufficient Water (Inefficient use of irrigation water), Water Quality Degradation (Excess nutrients in surface and ground waters, Excessive salts in surface and ground waters, Excess pathogens and chemicals from manure, bio-solids or compost applications). Associated Practices: Irrigation Pipeline (430), Pumping Plant (533), Irrigation Water Management (449)

Before Situation:

A 160 acre field is flood irrigated. Application of irrigation water is inefficient and non-uniform. Irrigation water is typically over applied in some parts of the field, and under applied in others. Deep percolation from the excess irrigation delivers excess nutrients salts, and chemicals to the ground water. Runoff from the field contains excess nutrients and degrades the receiving waters. Irrigated induced erosion is excessive.

After Situation:

The existing surface irrigation system is converted to a low pressure center pivot. Corners are converted to non-irrigated cropland. The pivot is 1300 feet in length with pressure regulators and low pressure sprinklers on drops. 120 acres are irrigated by the sprinkler system. The new irrigation system has a coefficient of uniformity above 85%. Irrigation water is efficiently and uniformly applied to maintain adequate soil water for the desired level of plant growth. Deep percolation and field runoff is eliminated and there are no excess nutrients, salts or pathogens delivered to the receiving waters. Irrigation induced runoff is eliminated. This center pivot scenario includes all hardware from the pivot point, including the concrete pad the pivot is placed on.

Feature Measure: Length of Center Pivot Lateral

Scenario Unit: Acres

Scenario Typical Size: 120.0

Scenario Total Cost: $102,002.32

Scenario Cost/Unit: $850.02

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Materials						
Irrigation, Center pivot system with appurtenances, fixed cost portion	317	Fixed cost portion of the center pivot system with appurtenances. This portion includes the following items: pivot point, pipe, towers, pad, controls, sprinklers, installation.	Each	$5,408.72	1	$5,408.72
Irrigation, Center pivot system with appurtenances, variable cost portion	318	Variable cost portion of the center pivot system with appurtenances. This portion includes the following items: pivot point, pipe, towers, pad, controls, sprinklers, installation.	Feet	$58.84	1300	$76,492.00
Poly Lining	2451	Poly lining protects the sprinkler system and increases the efficiency and lifespan.	Feet	$15.00	1300	$19,500.00
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	2	$130.18
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 442 - Sprinkler System

Scenario: #3 - Linear Move System

Scenario Description:

Installation of a linear or lateral move sprinkler system with sprinklers on drops with or without drag hoses to improve irrigation efficiency and reduce soil erosion. Resource concerns include: Soil Erosion (Concentrated flow erosion e.g. irrigation induced), Insufficient Water (Inefficient use of irrigation water), Water Quality Degradation (Excess nutrients in surface and ground waters, Excessive salts in surface and ground waters, Excess pathogens and chemicals from manure, bio-solids or compost applications), Inefficient Energy Use (Equipment and facilities e.g. pumping) Associated Practices: Irrigation Pipeline (430), Pumping Plant (533), Irrigation Water Management (449) Payment rate is figured per foot of installed hardware length.

Before Situation:

A 76 acre field is flood irrigated. Application of irrigation water is inefficient and non-uniform. Irrigation water is typically over applied in some parts of the field, and under applied in others. Deep percolation from the excess irrigation delivers excess nutrients salts, and chemicals to the ground water. Runoff from the field contains excess nutrients and degrades the receiving waters. Irrigated induced erosion is excessive.

After Situation:

A typical unit is approximately 76 acres in size with the sprinkler system up to 1280 feet in length with drop tubes that have a minimum of 30" spacing. The new irrigation system has a coefficient of uniformity above 85%. Irrigation water is efficiently and uniformly applied to maintain adequate soil water for the desired level of plant growth. Deep percolation and field runoff is eliminated and there are no excess nutrients, salts or pathogens delivered to the receiving waters. Irrigation induced runoff is eliminated.

Feature Measure: Length of Linear Move Lateral

Scenario Unit: Feet

Scenario Typical Size: 1,280.0

Scenario Total Cost: $144,316.08

Scenario Cost/Unit: $112.75

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Materials						
Linear Move System with appurtenances	322	Linear/lateral move system including: central tower, lateral towers, pipes, sprinklers, controllers, installation.	Acres	$1,890.98	76	$143,714.48
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	2	$130.18
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 442 - Sprinkler System

Scenario: #4 - Linear Move, poly lined

Scenario Description:

Installation of a linear or lateral move sprinkler system with sprinklers on drops with or without drag hoses to improve irrigation efficiency and reduce soil erosion. Irrigation water quality is such that normal galvanized steel will deteriorate before meeting the life expectancy of this practice. Resource concerns include: Soil Erosion (Concentrated flow erosion e.g. irrigation induced), Insufficient Water (Inefficient use of irrigation water), Water Quality Degradation (Excess nutrients in surface and ground waters, Excessive salts in surface and ground waters, Excess pathogens and chemicals from manure, bio-solids or compost applications), Inefficient Energy Use (Equipment and facilities e.g. pumping) Associated Practices: Irrigation Pipeline (430), Pumping Plant (533), Irrigation Water Management (449) Payment rate is figured per foot of installed hardware length.

Before Situation:

A 76 acre field is flood irrigated. Application of irrigation water is inefficient and non-uniform. Irrigation water is typically over applied in some parts of the field, and under applied in others. Deep percolation from the excess irrigation delivers excess nutrients salts, and chemicals to the ground water. Runoff from the field contains excess nutrients and degrades the receiving waters. Irrigated induced erosion is excessive.

After Situation:

A typical unit is approximately 76 acres in size with the sprinkler system up to 1280 feet in length with drop tubes that have a minimum of 30" spacing. The new irrigation system has a coefficient of uniformity above 85%. Irrigation water is efficiently and uniformly applied to maintain adequate soil water for the desired level of plant growth. Deep percolation and field runoff is eliminated and there are no excess nutrients, salts or pathogens delivered to the receiving waters. Irrigation induced runoff is eliminated.

Feature Measure: Length of Linear Move Lateral

Scenario Unit: Feet

Scenario Typical Size: 1,280.0

Scenario Total Cost: $163,516.08

Scenario Cost/Unit: $127.75

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Materials						
Linear Move System with appurtenances	322	Linear/lateral move system including: central tower, lateral towers, pipes, sprinklers, controllers, installation.	Acres	$1,890.98	76	$143,714.48
Poly Lining	2451	Poly lining protects the sprinkler system and increases the efficiency and lifespan.	Feet	$15.00	1280	$19,200.00
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	2	$130.18
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 442 - Sprinkler System

Scenario: #5 - Wheel Line System

Scenario Description:

A 1,280 foot wheel line (also called side roll, wheelmove, or lateral-roll) with 7 foot diameter wheels and five inch diameter supply pipeline. A typical system irrigates 20 acres. A wheel line consists of the mover, lateral pipe, wheels, sprinklers, couplers, and connectors to the mainline supply. Resource concerns include: Soil Erosion (Concentrated flow erosion e.g. irrigation induced), Insufficient Water (Inefficient use of irrigation water), Water Quality Degradation (Excess nutrients in surface and ground waters, Excessive salts in surface and ground waters, Excess pathogens and chemicals from manure, bio-solids or compost applications), Inefficient Energy Use (Equipment and facilities e.g. pumping) Associated Practices: Irrigation Pipeline (430), Pumping Plant (533), Irrigation Water Management (449)

Before Situation:

Cropland that is flood irrigated and has poor irrigation efficiency and distribution uniformity. The slope and irregular shape of the field limit the potential for improved management to improve the irrigation efficiency or the distribution uniformity. Irrigation water moves both within the field and off it, resulting in wet areas, runoff and deep percolation. Parts of the field are over-irrigated, and other sections are under-irrigated. Runoff from the field flows into streams, water courses, and other water bodies. Excess applied irrigation water infiltrates into ground water causing degradation to the receiving waters.

After Situation:

A 1,280 foot wheel line with 7 foot diameter wheels and five inch diameter supply pipeline. Sprinklers are spaced along the wheel line at 40-foot intervals and risers are spaced at 60-foot increments along the mainline. The wheel line irrigates 20 acres of cropland. The wheel line improves distribution uniformity. Irrigation application efficiency improves to 75%. Water application rates meet the consumptive use of the crop and matches soil intake rates in order to prevent irrigation induced erosion, runoff, and deep percolation.

Feature Measure: Length of Wheel Line Lateral

Scenario Unit: Feet

Scenario Typical Size: 1,280.0

Scenario Total Cost: $24,636.10

Scenario Cost/Unit: $19.25

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Materials						
Irrigation, Wheel line with appurtenances, fixed price portion.	325	Fixed cost portion of the wheel line system with appurtenances. This portion includes the following items: mover, pipe, sprinklers, wheels, installation.	Each	$6,744.64	1	$6,744.64
Irrigation, Wheel line with appurtenances, variable price portion.	326	Variable cost portion of the wheel line system with appurtenances. This portion includes the following items: pipe, sprinklers, wheels, installation. Does not include a mover.	Feet	$13.73	1280	$17,574.40
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	2	$317.06

Practice: 442 - Sprinkler System

Scenario: #6 - Solid Set System

Scenario Description:

A solid set irrigation system. Resource concerns include: Soil Erosion (Concentrated flow erosion e.g. irrigation induced), Insufficient Water (Inefficient use of irrigation water), Water Quality Degradation (Excess nutrients in surface and ground waters, Excessive salts in surface and ground waters, Excess pathogens and chemicals from manure, bio-solids or compost applications) Associated Practices: Irrigation Pipeline (430), Pumping Plant (533), Irrigation Water Management (449)

Before Situation:

The typical installation will be on cropland with some existing inefficient irrigation. The farm is typically producing specialty crops, such as fresh vegetables.

After Situation:

The system is installed on 10 acres or less. The installed solid set system has 3-4 inch pipe sizes and sprinklers set 30 - 50 ft apart. Improved distribution uniformity and irrigation efficiency will result.

Feature Measure: Area of Irrigation System

Scenario Unit: Acres

Scenario Typical Size: 10.0

Scenario Total Cost: $42,499.48

Scenario Cost/Unit: $4,249.95

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Materials						
Irrigation, Solid Set, w/Appurtenances	324	Solid Set irrigation system that includes pipe, sprinklers, connections, installation and appurtenances.	Acres	$4,236.93	10	$42,369.30
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	2	$130.18

Practice: 442 - Sprinkler System

Scenario: #7 - Traveling Gun System, < 2 inch Hose

Scenario Description:

A portable small gun system used to apply irrigation water on small fields. A small traveling gun irrigation system is installed to apply water uniformly and at an acceptable application rate operated under pressure to effectively irrigate less than 3 acres. The irrigation system is installed with all necessary appurtenances. Resource concerns: Soil Erosion (Concentrated flow erosion, e.g. overflowing waste storage) and Water Quality Degradation (Excess nutrients in surface and ground waters, Excessive salts in surface and ground waters, Excess pathogens and chemicals from liquid manure) Associated Practices: Irrigation Pipeline (430), Pumping Plant (533), Irrigation Water Management (449), Conservation Crop Rotation (328), Cover Crop (340), Nutrient Management (590), Waste Utilization (633), Manure Transfer (634)

Before Situation:

An existing traveling gun on a 5 acre field is inefficient and is not applying water uniformly or not at an acceptable application rate. Excess applied water causes irrigation induced erosion, runoff and deep percolation. The runoff and deep percolation degrade the receiving waters.

After Situation:

A small traveling gun irrigation system is installed to irrigate 5 acres based on the determined spacing needs. Irrigation is applied efficiently and uniformly to maintain adequate soil water for plant growth without causing excessive water loss, erosion, or water quality degradation The irrigation system is installed with all necessary appurtenances.

Feature Measure: Number of Traveling Gun Systems

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $12,068.92

Scenario Cost/Unit: $12,068.92

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Materials						
Irrigation, Traveling Gun System with <= 2 in. Nominal size hose, and appurtenances light duty	1478	Irrigation, Traveling Gun System with <= 2 inch Nominal size hose with appurtenances. This includes the sprinkler gun, traveler cart, hard hose, reel, connections, controls, and installation. Normal hose length 500'	Inch Diameter	$6,034.46	2	$12,068.92

Practice: 442 - Sprinkler System

Scenario: #8 - Traveling Gun System, 2 to 3 inch Hose

Scenario Description:

A portable big gun system used to apply waste water from animal feeding operations. This traveling big gun unit includes a sprinkler, towable cart, 1000’ or more of PE hard hose, a self propelled reel that moves the sprinkler toward the reel during operation. The reel attaches to a mainline with appropriately designed towpath width. The scenario describes an irrigation system that is typical to confined animal feeding operations. Resource concerns: Soil Erosion (Concentrated flow erosion, e.g. overflowing waste storage) and Water Quality Degradation (Excess nutrients in surface and ground waters, Excessive salts in surface and ground waters, Excess pathogens and chemicals from liquid manure) Associated Practices: Irrigation Pipeline (430), Pumping Plant (533), Irrigation Water Management (449), Conservation Crop Rotation (328), Cover Crop (340), Nutrient Management (590), Waste Utilization (633), Manure Transfer (634)

Before Situation:

A confined, animal operation has a waste management system that exceeds its capacity, or a operation that does not have a waste management system in place. The inefficiency of the existing system or the lack of a waste management system has an impact on the soil and water quality. Animal waste runs off and degrades the receiving waters.

After Situation:

The big gun applies animal manure in an appropriate quantity and location that eliminates both runoff of the manure and deep percolation of excess nutrients, salts, and pathogens. The big gun system is typically located on 50 acres or less of hay/pasture land, or 100 acres or less of cropland. The system includes a large irrigation gun with 1” to 1½” orifice mounted onto a movable cart. 1000’ or more flexible 3” PE pipe is attached to the cart on one end and a large reel on the other end. The reel serves as storage are for the pipe as the cart moves back to the reel. The reel is turned by a small engine which gradually pulls the flexible pipe and cart back to the reel/base.

Feature Measure: Number of Traveling Gun Systems

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $22,538.25

Scenario Cost/Unit: $22,538.25

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Materials						
Irrigation, Traveling Gun System, > 2 to 3 inch Nominal size hose	1479	Irrigation, Traveling Gun System with 2.3 to 3 inch Nominal size hose with appurtenances. This includes the sprinkler gun, traveler cart, hard hose, reel, connections, controls, and installation. Normal hose length 1000'.	Inch Diameter	$7,512.75	3	$22,538.25

Practice: 442 - Sprinkler System

Scenario: #9 - Traveling Gun System, > 3 inch Hose

Scenario Description:

A portable big gun system used to apply waste water from animal feeding operations. This traveling big gun unit includes a sprinkler, towable cart, 1200’ or more of PE hard hose, a self propelled reel that moves the sprinkler toward the reel during operation. The reel attaches to a mainline with appropriately designed towpath width. The scenario describes an irrigation system that is typical to confined animal feeding operations. Resource concerns: Soil Erosion (Concentrated flow erosion, e.g. overflowing waste storage) and Water Quality Degradation (Excess nutrients in surface and ground waters, Excessive salts in surface and ground waters, Excess pathogens and chemicals from liquid manure) Associated Practices: Irrigation Pipeline (430), Pumping Plant (533), Irrigation Water Management (449), Conservation Crop Rotation (328), Cover Crop (340), Nutrient Management (590), Waste Utilization (633), Manure Transfer (634)

Before Situation:

A confined, animal operation has a waste management system that exceeds its capacity, or a operation that does not have a waste management system in place. The inefficiency of the existing system or the lack of a waste management system has an impact on the soil and water quality. Animal waste runs off and degrades the receiving waters.

After Situation:

The big gun applies animal manure in an appropriate quantity and location that eliminates both runoff of the manure and deep percolation of excess nutrients, salts, and pathogens. The big gun system is typically located on 50 acres or less of hay/pasture land, or 100 acres or less of cropland. The system includes a large irrigation gun with 1” to 1½” orifice mounted onto a movable cart. 1200’ or more flexible 4” PE pipe is attached to the cart on one end and a large reel on the other end. The reel serves as storage are for the pipe as the cart moves back to the reel. The reel is turned by a small engine which gradually pulls the flexible pipe and cart back to the reel/base.

Feature Measure: Number of Traveling Gun Systems

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $42,627.52

Scenario Cost/Unit: $42,627.52

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Materials						
Irrigation, Traveling Gun System, > 3 inch Nominal size hose	1762	Irrigation, Traveling Gun System with > 3 inch Nominal size hose with appurtenances. This includes the sprinkler gun, traveler cart, hard hose, reel, connections, controls, and installation. Normal hose length 1300'	Each	$42,627.52	1	$42,627.52

Practice: 442 - Sprinkler System

Scenario: #10 - Pod System

Scenario Description:

A portable irrigation system consisting of Polyethylene (PE) pipe and pods that have attached sprinklers. This scenario addresses installation of all pod style irrigation sprinkler systems. Resource concerns include: Soil Erosion (Concentrated flow erosion e.g. irrigation induced), Insufficient Water (Inefficient use of irrigation water), Water Quality Degradation (Excess nutrients in surface and ground waters, Excessive salts in surface and ground waters, Excess pathogens and chemicals from manure, bio-solids or compost applications) Associated Practices: Irrigation Pipeline (430), Pumping Plant (533), Irrigation Water Management (449)

Before Situation:

Pastureland is flood irrigated and has poor irrigation efficiency and distribution uniformity. The slope and irregular shape of the field limit the potential for improved management to improve the irrigation efficiency or the distribution uniformity. Irrigation water moves both within the field and off it, resulting in wet areas, runoff and deep percolation. Runoff from the field flows into streams, water courses, and other water bodies. Excess applied irrigation water infiltrates into ground water causing degradation to the receiving waters.

After Situation:

A 10 acre irrigated pasture with a medium pressure irrigation system consisting of sprinkler pods along a PE line is installed. The pods and PE line are placed in different sections of the pasture by dragging both with a four wheeler. The PE line is 660 feet in length and has 14 pods evenly spaced along its length. The improved distribution uniformity and irrigation efficiency reduces the inefficient use of water on irrigated land, reducing irrigation water applied and energy use. Water application rates meet the pasture vegetation consumptive use requirements. Runoff and deep percolation as a result of irrigation are eliminated, and the receiving waters are no longer degraded.

Feature Measure: Number of Sprinkler Pods

Scenario Unit: Each

Scenario Typical Size: 14.0

Scenario Total Cost: $3,864.68

Scenario Cost/Unit: $276.05

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Materials						
Irrigation, Pod System, w/Appurtenances	323	Pod irrigation system that includes pod, pipe, sprinklers, connections, and appurtenances. Includes materials only.	Each	$266.75	14	$3,734.50
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	2	$130.18

Practice: 442 - Sprinkler System

Scenario: #11 - Renovation of Existing Sprinkler System

Scenario Description:

Center Pivot and Linear Move sprinkler systems are used in large crop fields with fairly regular field borders and flat topography. The scenario involves changing nozzles on center pivot or lateral move irrigation systems to low-pressure systems to improve efficiency of water use and reduce energy use. This scenario is intended for cropland areas where the objective is water conservation. A typical scenario assumes a 1300 LF span, including end booms renozzled with low-pressure nozzles. Resource concerns include: Soil Erosion (Concentrated flow erosion e.g. irrigation induced), Insufficient Water (Inefficient use of irrigation water), Water Quality Degradation (Excess nutrients in surface and ground waters, Excessive salts in surface and ground waters, Excess pathogens and chemicals from manure, bio-solids or compost applications), Inefficient Energy Use (Equipment and facilities e.g. pumping) Associated Practices: Irrigation Pipeline (430), Pumping Plant (533), Irrigation Water Management (449)

Before Situation:

A center pivot or lateral move system has high pressure sprinklers. The nozzles are worn and water is applied non-uniformly. Water runs off the field and degrades the receiving waters. Deep percolation in some parts of the field degrades the ground water quality. The runoff from the field causes soil erosion. The high pressure requirement for the system requires excess energy use.

After Situation:

A Center Pivot or Linear Move sprinkler system with a span of 1300 linear feet is re-nozzled with low-pressure nozzles. The irrigation water is applied efficiently and uniformly to maintain adequate soil moisture for optimum plant growth. Runoff and deep percolation are eliminated, and the surface and ground water is no longer degraded. The irrigation induced soil erosion caused by runoff is also eliminated. The lower pressure requirements of the sprinklers reduces the energy used by the pump.

Feature Measure: Length of Lateral Retrofitted

Scenario Unit: Feet

Scenario Typical Size: 1,300.0

Scenario Total Cost: $8,582.45

Scenario Cost/Unit: $6.60

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Aerial lift, telescoping bucket	1893	Aerial lift, bucket truck or cherry picker, typical 40' boom. Equipment only.	Hours	$35.36	8	$282.88
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	8	$211.68
Materials						
Irrigation, Sprinkler Package, Renozzle or Retrofit, with drops and pressure regulators	1480	Sprinkler Package - Rennovation including sprinkler nozzle addition, and/or replacement, including new pressure regulators and drops.	Feet	$5.94	1300	$7,722.00
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	2	$130.18
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 442 - Sprinkler System

Scenario: #12 - Handline

Scenario Description:

This Scenario addresses installation of all handline style irrigation sprinkler systems. A typical quarter mile handline has 1280 lineal feet of 3-4 inch aluminum pipe. Typical field size is 20 acres. Payment rates are based on installed costs. Costs do not include irrigation mainline or risers, pumping plant, or other associated practices. Associated Practices: Irrigation Pipeline (430), Pumping Plant (533), Irrigation Water Management (449)

Before Situation:

The typical installation will be on cropland with some existing inefficient irrigation. The farm is typically producing pasture, alfalfa or specialty crops, such as fresh vegetables.

After Situation:

A handline will be installed to increase irrigation water use efficiency. Water application rates will meet the crops use needs as well as soil intake rates in order to prevent irrigation induced erosion, runoff, and deep percolation. Installation includes the handline. The typical scenario is a 1280 foot long, periodic move handline which covers 20 acre field. Nozzles are spaced along the handline at 40 foot increments and risers are spaced 60 foot increments along the main line. Payment rates are figured per foot of installed hardware length. Improved distribution uniformity and irrigation efficiency will result.

Feature Measure: Length of handline

Scenario Unit: Acres

Scenario Typical Size: 20.0

Scenario Total Cost: $6,286.98

Scenario Cost/Unit: $314.35

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Materials						
Irrigation, Handline, w/Appurtenances	321	Handline irrigation system that includes pipe, sprinklers, connections and appurtenances. Includes materials only.	Feet	$4.81	1280	$6,156.80
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	2	$130.18

Practice: 442 - Sprinkler System

Scenario: #26 - Center Pivot, 0-60 Acres

Scenario Description:

"Installation of a low pressure center pivot system. Resource concerns include: Soil Erosion (Concentrated flow erosion e.g. irrigation induced), Insufficient Water (Inefficient use of irrigation water), Water Quality Degradation (Excess nutrients in surface and ground waters, Excessive salts in surface and ground waters, Excess pathogens and chemicals from manure, bio-solids or compost applications). Associated Practices: Irrigation Pipeline (430), Pumping Plant (533), Irrigation Water Management (449)"

Before Situation:

A 30 acre field is flood irrigated. Application of irrigation water is inefficient and non-uniform. Irrigation water is typically over applied in some parts of the field, and under applied in others. Deep percolation from the excess irrigation delivers excess nutrients salts, and chemicals to the ground water. Runoff from the field contains excess nutrients and degrades the receiving waters. Irrigated induced erosion is excessive.

After Situation:

"The existing surface irrigation system is converted to a low pressure center pivot. Corners are converted to non-irrigated cropland. The pivot is 644 feet in length with pressure regulators and low pressure sprinklers on drops. 30 acres are irrigated by the sprinkler system. The new irrigation system has a coefficient of uniformity above 85%. Irrigation water is efficiently and uniformly applied to maintain adequate soil water for the desired level of plant growth. Deep percolation and field runoff is eliminated and there are no excess nutrients, salts or pathogens delivered to the receiving waters. Irrigation induced runoff is eliminated. This center pivot scenario includes all hardware from the pivot point, including the concrete pad the pivot is placed on."

Feature Measure: Length of Center Pivot

Scenario Unit: Acres

Scenario Typical Size: 30.0

Scenario Total Cost: $43,903.28

Scenario Cost/Unit: $1,463.44

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Materials						
Irrigation, Center pivot system with appurtenances, fixed cost portion	317	Fixed cost portion of the center pivot system with appurtenances. This portion includes the following items: pivot point, pipe, towers, pad, controls, sprinklers, installation.	Each	$5,408.72	1	$5,408.72
Irrigation, Center pivot system with appurtenances, variable cost portion	318	Variable cost portion of the center pivot system with appurtenances. This portion includes the following items: pivot point, pipe, towers, pad, controls, sprinklers, installation.	Feet	$58.84	644	$37,892.96
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	2	$130.18
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 442 - Sprinkler System

Scenario: #27 - Center Pivot System, 61-100 Acres

Scenario Description:

"Installation of a low pressure center pivot system. Resource concerns include: Soil Erosion (Concentrated flow erosion e.g. irrigation induced), Insufficient Water (Inefficient use of irrigation water), Water Quality Degradation (Excess nutrients in surface and ground waters, Excessive salts in surface and ground waters, Excess pathogens and chemicals from manure, bio-solids or compost applications). Associated Practices: Irrigation Pipeline (430), Pumping Plant (533), Irrigation Water Management (449)"

Before Situation:

A 80 acre field is flood irrigated. Application of irrigation water is inefficient and non-uniform. Irrigation water is typically over applied in some parts of the field, and under applied in others. Deep percolation from the excess irrigation delivers excess nutrients salts, and chemicals to the ground water. Runoff from the field contains excess nutrients and degrades the receiving waters. Irrigated induced erosion is excessive.

After Situation:

"The existing surface irrigation system is converted to a low pressure center pivot. Corners are converted to non-irrigated cropland. The pivot is 1053 feet in length with pressure regulators and low pressure sprinklers on drops. 80 acres are irrigated by the sprinkler system. The new irrigation system has a coefficient of uniformity above 85%. Irrigation water is efficiently and uniformly applied to maintain adequate soil water for the desired level of plant growth. Deep percolation and field runoff is eliminated and there are no excess nutrients, salts or pathogens delivered to the receiving waters. Irrigation induced runoff is eliminated. This center pivot scenario includes all hardware from the pivot point, including the concrete pad the pivot is placed on."

Feature Measure: Length of Center Pivot System

Scenario Unit: Acres

Scenario Typical Size: 80.0

Scenario Total Cost: $67,968.84

Scenario Cost/Unit: $849.61

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Materials						
Irrigation, Center pivot system with appurtenances, fixed cost portion	317	Fixed cost portion of the center pivot system with appurtenances. This portion includes the following items: pivot point, pipe, towers, pad, controls, sprinklers, installation.	Each	$5,408.72	1	$5,408.72
Irrigation, Center pivot system with appurtenances, variable cost portion	318	Variable cost portion of the center pivot system with appurtenances. This portion includes the following items: pivot point, pipe, towers, pad, controls, sprinklers, installation.	Feet	$58.84	1053	$61,958.52
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	2	$130.18
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 442 - Sprinkler System

Scenario: #28 - Center Pivot System, 101 or Larger Acres

Scenario Description:

"Installation of a low pressure center pivot system. Resource concerns include: Soil Erosion (Concentrated flow erosion e.g. irrigation induced), Insufficient Water (Inefficient use of irrigation water), Water Quality Degradation (Excess nutrients in surface and ground waters, Excessive salts in surface and ground waters, Excess pathogens and chemicals from manure, bio-solids or compost applications). Associated Practices: Irrigation Pipeline (430), Pumping Plant (533), Irrigation Water Management (449)"

Before Situation:

A 120 acre field is flood irrigated. Application of irrigation water is inefficient and non-uniform. Irrigation water is typically over applied in some parts of the field, and under applied in others. Deep percolation from the excess irrigation delivers excess nutrients salts, and chemicals to the ground water. Runoff from the field contains excess nutrients and degrades the receiving waters. Irrigated induced erosion is excessive.

After Situation:

"The existing surface irrigation system is converted to a low pressure center pivot. Corners are converted to non-irrigated cropland. The pivot is 1300 feet in length with pressure regulators and low pressure sprinklers on drops. 120 acres are irrigated by the sprinkler system. The new irrigation system has a coefficient of uniformity above 85%. Irrigation water is efficiently and uniformly applied to maintain adequate soil water for the desired level of plant growth. Deep percolation and field runoff is eliminated and there are no excess nutrients, salts or pathogens delivered to the receiving waters. Irrigation induced runoff is eliminated. This center pivot scenario includes all hardware from the pivot point, including the concrete pad the pivot is placed on."

Feature Measure: Length of Center Pivot System

Scenario Unit: Acres

Scenario Typical Size: 120.0

Scenario Total Cost: $82,502.32

Scenario Cost/Unit: $687.52

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Materials						
Irrigation, Center pivot system with appurtenances, fixed cost portion	317	Fixed cost portion of the center pivot system with appurtenances. This portion includes the following items: pivot point, pipe, towers, pad, controls, sprinklers, installation.	Each	$5,408.72	1	$5,408.72
Irrigation, Center pivot system with appurtenances, variable cost portion	318	Variable cost portion of the center pivot system with appurtenances. This portion includes the following items: pivot point, pipe, towers, pad, controls, sprinklers, installation.	Feet	$58.84	1300	$76,492.00
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	2	$130.18
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 443 - Irrigation System, Surface and Subsurface

Scenario: #1 - Surge Valve & Controller

Scenario Description:

This scenario would typically include installation and utilization of a 10-inch surge valve with automated controller (including all appurtenances) and installation labor needed to convert from a conventional surface irrigated system to a surge irrigation system. Typical field size is 80 acres. The surge valve will be used with PVC Gated Pipe or PE Gated Tubing to convey and distribute irrigation water to alternating irrigation sets in a timed surge cycle that results in reduced a surging irrigation application. The surging action increases rate of advance along set length, reduces deep percolation at upper end of field, increases uniformity of application along row length, and on lower intake soils can significantly reduce runoff losses. The result is improved irrigation efficiency, reduced leaching and erosion losses, and conserved energy. This scenario does not include gated pipe or associated practices. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, and Degraded Plant Condition - Undesirable plant productivity and health, Water Quality Degradation- Excess nutrients in surface and ground waters, Water Quality Degradation - Excessive sediment in surface waters, and Inefficient Energy Use - Equipment and facilities Associated Practices: 464-Irrigation Land leveling, 533-Pumping Plant, 449- Irrigation Water Management, 430 - Irrigation Pipeline, 328-Conservation Crop Rotation, and 590 Nutrient Management.

Before Situation:

Unacceptable irrigation application uniformity along existing surface irrigation system furrow or border length caused by excessive run length or soil infiltration rate when operated with continuous inflow on existing system. System is over irrigated in attempt to adequately irrigate low end of field.

After Situation:

A surge surface irrigation system is in place. After implementation, distribution uniformity and irrigation efficiency is improved, by reducing irrigation application volume and deep percolation losses. Runoff reductions, reduced energy use, and air quality improvements can also result.

Feature Measure: Number of Surge Valves

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $2,570.72

Scenario Cost/Unit: $2,570.72

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	2	$48.38
Materials						
Surge Valve And Controller	1477	Surge Valve and Controller, with appurtenances. Material cost includes valve, controller, all appurtenances, and mobilization.	Each	$2,522.34	1	$2,522.34

Practice: 443 - Irrigation System, Surface and Subsurface

Scenario: #2 - Aluminum Gated Pipe

Scenario Description:

Installation of surface Aluminum gated pipe to efficiently convey and distribute irrigation water in irrigation furrows, borders, or contour levees. A typical scenario would include 1,320 feet of 10-inch Aluminum gated pipe, with 40 inch gate spacing used to irrigate 60 acres. Appurtenances include: gates, couplings, fittings, in-line valves, pressure relief valves, and air vent valves. Does not include flow meters, or a permanent inlet structure with or without filtration. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, and Degraded Plant Condition - Undesirable Plant productivity and health. Associated Practices: 464-Irrigation Land leveling, 533-Pumping Plant, 449- Irrigation Water Management, 430 - Irrigation Pipeline, 328-Conservation Crop Rotation, and 590 Nutrient Management.,

Before Situation:

Typical before situation would include conveyance of water to surface irrigation distribution points with earthen ditches and distribution to individual furrows, borders, or contour levies by siphon tubes. The existing system would experience significant seepage ditch losses, and poor distribution uniformity.

After Situation:

The installation will improve distribution uniformity, irrigation efficiency, and eliminate or reduce ditch seepage.

Feature Measure: Weight of Pipe

Scenario Unit: Pound

Scenario Typical Size: 2,442.0

Scenario Total Cost: $12,678.08

Scenario Cost/Unit: $5.19

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	10	$241.90
Materials						
Pipe, aluminum, smooth wall, weight priced	1382	Aluminum manufactured into smooth wall pipe	Pound	$4.63	2686	$12,436.18

Practice: 443 - Irrigation System, Surface and Subsurface

Scenario: #3 - Polyvinyl Chloride (PVC) Gated Pipe

Scenario Description:

Installation of surface PVC gated pipe to efficiently convey and distribute irrigation water in irrigation furrows, borders, or contour levees. A typical scenario would include 1,320 feet of 10-inch PVC gated pipe, with 40 inch gate spacing used to irrigate 60 acres. Appurtenances include: gates, couplings, fittings, in-line valves, pressure relief valves, and air vent valves. Does not include flow meters, or a permanent inlet structure with or without filtration. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, and Degraded Plant Condition - Undesirable Plant productivity and health. Associated Practices: 464-Irrigation Land leveling, 533-Pumping Plant, 449-Irrigation Water Management, 430 - Irrigation Pipeline, 328-Conservation Crop Rotation, and 590 Nutrient Management.,

Before Situation:

Typical before situation would include conveyance of water to surface irrigation distribution points with earthen ditches and distribution to individual furrows, borders, or contour levies by siphon tubes. The existing system would experience significant seepage ditch losses, and poor distribution uniformity.

After Situation:

The installation will improve distribution uniformity, irrigation efficiency, and eliminate or reduce ditch seepage.

Feature Measure: Weight of Pipe

Scenario Unit: Pound

Scenario Typical Size: 3,320.0

Scenario Total Cost: $8,678.02

Scenario Cost/Unit: $2.61

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	10	$241.90
Materials						
Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.31	3652	$8,436.12

Practice: 443 - Irrigation System, Surface and Subsurface

Scenario: #4 - Poly Irrigation Tubing

Scenario Description:

This practice includes installation of thin wall Polyethylene (PE) irrigation tubing with 2½-inch gates, or gated pipe installed in shallow above ground trenches to replace above ground canals used to deliver water to individual basins within a contour levee or basin surface irrigation system. The typical scenario will use 1,320 feet of 15-inch, 10 mil, PE irrigation tubing (a 1,320-foot roll weighs 250 pounds) with 100 2½-inch gates spaced approximately 13 feet apart, installed in shallow above ground trenches to replace above ground canals used to deliver water to individual basins within a 40-acre irrigated field. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, and Degraded Plant Condition - Undesirable plant productivity and health, Water Quality Degradation- Excess nutrients in surface and ground waters, Water Quality Degradation - Excessive sediment in surface waters, and Inefficient Energy Use - Equipment and facilities Associated Practices: 464-Irrigation Land leveling, 533-Pumping Plant, 449- Irrigation Water Management, 430 - Irrigation Pipeline, 328-Conservation Crop Rotation, and 590-Nutrient Management.

Before Situation:

Typical before situation would include a contour levee or basin surface irrigation system. Irrigation water is delivered to individual basins in a 40-acre rice field split into paddies using irrigation canals and field ditches.

After Situation:

After implementation irrigation efficiency is improved, while reducing irrigation application volume, runoff, evaporation losses, and cold water damage to crops. Reduced energy use and air quality improvements can also result.

Feature Measure: Weight of Pipe

Scenario Unit: Pound

Scenario Typical Size: 250.0

Scenario Total Cost: $855.90

Scenario Cost/Unit: $3.42

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	10	$241.90
Materials						
Pipe, PE, collapsible, weight priced	1385	Polyethylene (PE) compound manufactured into collapsible tubing	Pound	$1.78	250	$445.00
Flap gate, plastic, 2 1/2 in.	1424	2 1/2 inch plastic flap gate for poly irrigation tubing. Materials only.	Each	$1.69	100	$169.00

Practice: 443 - Irrigation System, Surface and Subsurface

Scenario: #8 - Polyvinyl Chloride (PVC) - Connection, Riser and Stand Pipe

Scenario Description:

Installation of a PVC stand pipe to efficiently convey and distribute irrigation water in furrow, border, or contour levee irrigation system. A typical scenario would include a 60 acre surface irrigation system, serving a 1,320 feet long field, with 20 ft. spacing between installed risers. A typical Installation under this scenario will include installation of a water distribution riser and stand pipe constructed with appurtenances that include: a rubber and PVC InsertaTee with fastener, a section of 6” dia pvc pipe approximately 42” long, and a pvc to pvc connection. This practice shall be installed in conjunction with PS 430, Pipe. There is not a valve installed on the risers under this scenario. The top of the stand pipe shall be above the Hydraulic Grade Line of the pipeline. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, and Degraded Plant Condition - Undesirable Plant productivity and health. Associated Practices: 430- Irrigation Pipeline, 464-Irrigation Land leveling, 449- Irrigation Water Management, 430 - Irrigation Pipeline, 328-Conservation Crop Rotation, and 590 Nutrient Management

Before Situation:

Typical before situation would include conveyance of water to surface irrigation distribution points with earthen ditches and distribution to individual furrows, borders, or contour levies by siphon tubes. The existing system would experience significant seepage ditch losses, and poor distribution uniformity.

After Situation:

The installation will improve surface irrigation system distribution uniformity, and efficiency, and eliminate or reduce ditch seepage. The system includes the installation of the Connection, Riser and Stand Pipe to provide water distribution and flow control along the irrigation system.

Feature Measure: Number of Risers

Scenario Unit: Each

Scenario Typical Size: 66.0

Scenario Total Cost: $4,536.32

Scenario Cost/Unit: $68.73

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	8	$193.52
Materials						
Pipe, PVC, 6 in., SCH 40	980	Materials: - 6 inch - PVC - SCH 40 - ASTM D1785	Feet	$6.58	660	$4,342.80

Practice: 449 - Irrigation Water Management

Scenario: #1 - Basic IWM <= 30 acres

Scenario Description:

A low Intensity irrigation water management system for producers using a checkbook method (crop grown, soil moisture conditions prior to irrigation, dates of irrigation start and stop, depths of irrigation applied, duration of irrigations, and amount of rainfall). For a typical scenario, soil moisture is determined by the feel method, volumes of irrigation water are based on energy or water district bills, records are kept on paper copies, and calculations are made by hand. Resource Concerns: Insufficient Water Supply-Inefficient use of irrigation water; Degraded Plant Condition-Undesirable plant productivity and health, and Inefficient Energy Use-Equipment and facilities. Associated Practices: 441-Irrigation System Microirrigation, 442-Irrigation System Sprinkler, 443-Irrigation System Surface and Subsurface, 433-Irrigation Water Measurement, 434-Soil Moisture Measurement, 433- Irrigation Flow Measurement.

Before Situation:

The irrigator decides when to irrigate based on general crop or soil appearance or limited soil moisture monitoring. System run times are based on past apparent success. The typical irrigated field is a 30 acre corn field with a surface irrigation system.

After Situation:

Irrigations are scheduled based on measured crop water requirements. Records are used to evaluate results of past irrigation events and influence future irrigations. The irrigator keeps records of soil moisture, crop water use, rainfall amounts and irrigation timing and amounts. At the end of the irrigation season all the data has been reviewed and evaluated. Improvements planned for the next season have been determined.

Feature Measure: Irrigated Area Managed

Scenario Unit: Acres

Scenario Typical Size: 30.0

Scenario Total Cost: $1,088.16

Scenario Cost/Unit: $36.27

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	24	$1,088.16

Practice: 449 - Irrigation Water Management

Scenario: #2 - Basic IWM > 30 acres

Scenario Description:

A low Intensity irrigation water management system for producers using a checkbook method (crop grown, soil moisture conditions prior to irrigation, dates of irrigation start and stop, depths of irrigation applied, duration of irrigations, and amount of rainfall). For a typical scenario, soil moisture is determined by the feel method, volumes of irrigation water are based on energy or water district bills, records are kept on paper copies, and calculations are made by hand. Resource Concerns: Insufficient Water Supply-Inefficient use of irrigation water; Degraded Plant Condition-Undesirable plant productivity and health, and Inefficient Energy Use-Equipment and facilities. Associated Practices: 441-Irrigation System Microirrigation, 442-Irrigation System Sprinkler, 443-Irrigation System Surface and Subsurface, 433-Irrigation Water Measurement, 434-Soil Moisture Measurement, 433- Irrigation Flow Measurement.

Before Situation:

The irrigator decides when to irrigate based on general crop or soil appearance or limited soil moisture monitoring. System run times are based on past apparent success. The typical irrigated field is a 125 acre corn field with a sprinkler irrigation system.

After Situation:

Irrigations are scheduled based on measured crop water requirements. Records are used to evaluate results of past irrigation events and influence future irrigations. The irrigator keeps records of soil moisture, crop water use, rainfall amounts and irrigation timing and amounts. At the end of the irrigation season all the data has been reviewed and evaluated. Improvements planned for the next season have been determined.

Feature Measure: Irrigated Area Managed

Scenario Unit: Acres

Scenario Typical Size: 125.0

Scenario Total Cost: $1,644.40

Scenario Cost/Unit: $13.16

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	8	$193.52
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	32	$1,450.88

Practice: 449 - Irrigation Water Management

Scenario: #3 - Intermediate IWM <= 30 acres

Scenario Description:

A medium intensity irrigation water management system for producers using a checkbook method (crop grown, soil moisture conditions prior to irrigation, dates of irrigation start and stop, depths of irrigation applied, duration of irrigations, and amount of rainfall). For a typical scenario, soil moisture is determined by in-field moisture sensors with manual downloads. Irrigation amounts are recorded from a flow meter near the pump. Records are input manually into an irrigation scheduling computer program. Resource Concerns: Insufficient Water Supply-Inefficient use of irrigation water; Degraded Plant Condition-Undesirable plant productivity and health, and Inefficient Energy Use-Equipment and facilities. Associated Practices: 441-Irrigation System Microirrigation, 442-Irrigation System Sprinkler, 443-Irrigation System Surface and Subsurface, 433-Irrigation Water Measurement, 434-Soil Moisture Measurement, 433- Irrigation Flow Measurement.

Before Situation:

The farmer decides when to irrigate based on general crop or soil appearance or limited soil moisture monitoring. System run times are based on past apparent success. The typical irrigated field is a 30 acre corn field with a surface irrigation system.

After Situation:

Irrigations are scheduled based on measured crop water requirements. Records are used to evaluate results of past irrigation events and influence future irrigations. The irrigator keeps records of soil moisture, crop water use, rainfall amounts and irrigation timing and amounts. At the end of the irrigation season all the data has been reviewed and evaluated. Improvements planned for the next season have been determined.

Feature Measure: Irrigated Area Managed

Scenario Unit: Acres

Scenario Typical Size: 30.0

Scenario Total Cost: $1,450.88

Scenario Cost/Unit: $48.36

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	32	$1,450.88

Practice: 449 - Irrigation Water Management

Scenario: #4 - Intermediate IWM > 30 acres

Scenario Description:

A medium intensity irrigation water management system for producers using a checkbook method (crop grown, soil moisture conditions prior to irrigation, dates of irrigation start and stop, depths of irrigation applied, duration of irrigations, and amount of rainfall). For a typical scenario, soil moisture is determined by in field moisture sensors with manual downloads. Irrigation amounts are recorded from a flow meter near the pump. Records are input manually into an irrigation scheduling computer program. Resource Concerns: Insufficient Water Supply-Inefficient use of irrigation water; Degraded Plant Condition-Undesirable plant productivity and health, and Inefficient Energy Use-Equipment and facilities. Associated Practices: 441-Irrigation System Microirrigation, 442-Irrigation System Sprinkler, 443-Irrigation System Surface and Subsurface, 433-Irrigation Water Measurement, 434-Soil Moisture Measurement, 433- Irrigation Flow Measurement.

Before Situation:

The farmer decides when to irrigate based on general crop or soil appearance or limited soil moisture monitoring. System run times are based on past apparent success. The typical irrigated field is a 125 acre corn field with a sprinkler irrigation system.

After Situation:

Irrigations are scheduled based on measured crop water requirements. Records are used to evaluate results of past irrigation events and influence future irrigations. The irrigator keeps records of soil moisture, crop water use, rainfall amounts and irrigation timing and amounts. At the end of the irrigation season all the data has been reviewed and evaluated. Improvements planned for the next season have been determined.

Feature Measure: Irrigated Area Managed

Scenario Unit: Acres

Scenario Typical Size: 125.0

Scenario Total Cost: $2,103.88

Scenario Cost/Unit: $16.83

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	12	$290.28
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	40	$1,813.60

Practice: 449 - Irrigation Water Management

Scenario: #5 - Advanced IWM <= 30 acres

Scenario Description:

A high intensity irrigation water management system for producers using a checkbook method with advanced methods of determining irrigation water applied, and estimating crop evapotranspiration, monitoring field soil moisture, or monitoring crop temperature stress. Typical methods include flow measurement, daily record keeping, and use of real-time evapotranspiration estimates (such as those provided dedicated weather stations) and/or soil moisture sensors with automated data logging to monitor field soil moisture content and/or crop temperature. For this scenario, soil moisture is determined by automated soil moisture monitoring stations equiped with telemetry data. Irrigation amounts are recorded from a flow meter near the pump. Telemetry data is automatically sent to a computer with irrigation software. Irrigator also receives real time data via mobile phone applications. Some data such as total water applied may be entered into computer software manually. Resource Concerns: Insufficient Water Supply-Inefficient use of irrigation water; Degraded Plant Condition-Undesirable plant productivity and health, and Inefficient Energy Use-Equipment and facilities. Associated Practices: 441-Irrigation System Microirrigation, 442-Irrigation System Sprinkler, 443-Irrigation System Surface and Subsurface, 433-Irrigation Water Measurement, 434-Soil Moisture Measurement, 433- Irrigation Flow Measurement.

Before Situation:

The farmer decides when to irrigate based on general crop or soil appearance or limited soil moisture monitoring. System run times are based on past apparent success. The typical irrigated field is a 30 acre corn field with a surface irrigation system.

After Situation:

Irrigations are scheduled based on measured crop water requirements. Records are used to evaluate results of past irrigation events and influence future irrigations. The irrigator keeps records of soil moisture, crop water use, rainfall amounts and irrigation timing and amounts. At the end of the irrigation season all the data has been reviewed and evaluated. Improvements planned for the next season have been determined.

Feature Measure: Irrigated Area Managed

Scenario Unit: Acres

Scenario Typical Size: 30.0

Scenario Total Cost: $1,813.60

Scenario Cost/Unit: $60.45

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	40	$1,813.60

Practice: 449 - Irrigation Water Management

Scenario: #6 - Advanced IWM > 30 acres

Scenario Description:

A high intensity irrigation water management system for producers using a checkbook method with advanced methods of determining irrigation water applied, and estimating crop evapotranspiration, monitoring field soil moisture, or monitoring crop temperature stress. Typical methods include flow measurement, daily record keeping, and use of real-time evapotranspiration estimates (such as those provided dedicated weather stations) and/or soil moisture sensors with automated data logging to monitor field soil moisture content and/or crop temperature. For this scenario, soil moisture is determined by automated soil moisture monitoring stations equiped with telemetry data. Irrigation amounts are recorded from a flow meter near the pump. Telemetry data is automatically sent to a computer with irrigation software. Irrigator also receives real time data via mobile phone applications. Some data such as total water applied may be entered into computer software manually. Resource Concerns: Insufficient Water Supply-Inefficient use of irrigation water; Degraded Plant Condition-Undesirable plant productivity and health, and Inefficient Energy Use-Equipment and facilities. Associated Practices: 441-Irrigation System Microirrigation, 442-Irrigation System Sprinkler, 443-Irrigation System Surface and Subsurface, 433-Irrigation Water Measurement, 434-Soil Moisture Measurement, 433- Irrigation Flow Measurement.

Before Situation:

The farmer decides when to irrigate based on general crop or soil appearance or limited soil moisture monitoring. System run times are based on past apparent success. The typical irrigated field is a 125 acre corn field with sprinkler irrigation.

After Situation:

Irrigations are scheduled based on measured crop water requirements. Records are used to evaluate results of past irrigation events and influence future irrigations. The irrigator keeps records of soil moisture, crop water use, rainfall amounts and irrigation timing and amounts. At the end of the irrigation season all the data has been reviewed and evaluated. Improvements planned for the next season have been determined.

Feature Measure: Irrigated Area Managed

Scenario Unit: Acres

Scenario Typical Size: 125.0

Scenario Total Cost: $2,563.36

Scenario Cost/Unit: $20.51

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	16	$387.04
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	48	$2,176.32

Practice: 449 - Irrigation Water Management

Scenario: #7 - Soil Moist Sensors_1stYr

Scenario Description:

This practice includes the installation of soil moisture sensors such as tensiometers, gyp blocks, capacitance sensors etc, that are installed and read to determine point in time soil moisture by depth; and the labor of using the equipment for the first year. The installation includes the purchase of soil moisture meters and sensors, installation equipment, and labor to install and utilize sensors and readings in making IWM decisions during first year. Typical Scenario involves installation of resistance sensor blocks in a 80 acre field of irrigated cropland. Producer periodically monitors soil moisture sensors during the growing season. Meters used to read sensors may be portable. This scenario only applies to year one IWM. The appropriate labor only IWM scenario applies in subsequent contract years. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, and Degraded Plant Condition - Undesirable plant productivity and health, and Inefficient Energy Use - Equipment and facilities. Associated Practices: 449- Irrigation Water Management, 587-Structure for water Control, 328-Conservation Crop Rotation, and 590-Nutrient Management.

Before Situation:

Producer uses feel method to estimate soil moisture for scheduling irrigation.

After Situation:

Producer has installed four sensors at each monitoring site to a depth of four feet with one sensor representing each foot of depth. Producer uses periodic soil moisture measurements to schedule irrigation resulting in improved irrigation water managment and reduced energy use.

Feature Measure: Number of Measuring Sites

Scenario Unit: Each

Scenario Typical Size: 2.0

Scenario Total Cost: $2,877.35

Scenario Cost/Unit: $1,438.68

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	12	$290.28
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	40	$1,813.60
Materials						
Soil Moisture Meter	1455	Soil Moisture Sensor Reader. Equipment only.	Each	$234.59	1	$234.59
Soil Moisture Sensor	1456	Soil moisture resistance sensor W/10' cables. Equipment only.	Each	$67.36	8	$538.88

Practice: 449 - Irrigation Water Management

Scenario: #8 - SoilMoist Sens.w.DataLogrs1stYR

Scenario Description:

This practice includes the installation of electrical soil moisture sensors such as capacitance or resistance sensors that are monitored to determine soil moisture. The installation includes the purchase of soil moisture sensors, installation equipment (probe or auger), and a data logger to log continuous soil moisture data that can be downloaded to a personal computer and associated graphing software. Scenario also includes the labor associated with using the equipment for the first year. Typical Scenario involves installation of resistance sensor blocks in a 120 acre field of sprinkler irrigated cropland. Producer periodically monitors soil moisture sensors during the growing season. This scenario only applies to year one IWM. The appropriate labor only IWM scenario applies in subsequent contract years. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, and Degraded Plant Condition - Undesirable plant productivity and health, and Inefficient Energy Use - Equipment and facilities. Associated Practices: 449- Irrigation Water Management, 587-Structure for water Control, 328-Conservation Crop Rotation, and 590-Nutrient Management.

Before Situation:

Producer uses feel method to estimate soil moisture for scheduling irrigation in the field.

After Situation:

Producer has installed four sensors at each monitoring site to a depth of four feet with one sensor representing each foot of depth. Producer periodically downloads continuously recorded soil moisture measurements that are used to schedule irrigation more effectively resulting in improved irrigation water managment and reduced energy use.

Feature Measure: Number of Measuring Sites

Scenario Unit: Each

Scenario Typical Size: 2.0

Scenario Total Cost: $3,930.82

Scenario Cost/Unit: $1,965.41

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	12	$290.28
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	40	$1,813.60
Materials						
Data Logger	1453	Data Logger W/Graphic Output for water management. Materials only.	Each	$644.03	2	$1,288.06
Soil Moisture Sensor	1456	Soil moisture resistance sensor W/10' cables. Equipment only.	Each	$67.36	8	$538.88

Practice: 449 - Irrigation Water Management

Scenario: #9 - Advanced Weather Station and Soil Moisture Sensors 1st Year

Scenario Description:

Description: This scenario includes the equipment, installation, and data interpretation services for intensive irrigation management and water resources monitoring and evaluation. Installation includes an advanced weather station, soil moisture sensors, and data logger and telemetry equipment. Scenario also includes the engineering consultation services labor associated with the analysis of collected data and development of management recommendations. This scenario applies only to the first year. The appropriate labor only scenario applies in subsequent years. This scenario applies only to sites without existing access to equivalent climatic data supplied by the advanced weather station. Locations with adequate weather data should consider the soil moisture sensor with data loggers first year scenario. Management scenario size is assumed as 160 acres, although weather data may be valid over a larger area. Resource Concerns: Insufficient Water- Inefficient use of irrigation water. Associated Practices Include: 449- Irrigation Water Management; 441- Irrigation System, Microirrigation; 442- Irrigation System, Sprinkler; 443- Irrigation System, Surface; and 587, Structure for Water Control.

Before Situation:

Producer ues the feel method to estimate soil moisture for scheduling irrigations.

After Situation:

An advanced weather station, soil moisture sensors, and telemetry equipment are used to continuously collect data. Engineering consultants hired by the producer analyze data and make irrigation recommendations and evaluate water resources data. Service results in improved irrigation water management and optimally scheduled irrigations.

Feature Measure: Irrigated Area Managed

Scenario Unit: Acres

Scenario Typical Size: 160.0

Scenario Total Cost: $11,637.40

Scenario Cost/Unit: $72.73

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	16	$545.92
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	32	$1,450.88
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	32	$3,558.72
Materials						
Data Logger with Telemetry System	1454	Data Logger W/Graphic Output for water management and telemetry - data communication device with power supply in a weather proof enclosure. Equipment only.	Each	$1,577.29	3	$4,731.87
Soil Moisture Sensor	1456	Soil moisture resistance sensor W/10' cables. Equipment only.	Each	$67.36	8	$538.88
Weather Station, Advanced	2550	Advance Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, temperature, and solar radiation from a solar powered self-standing tripod to an advance weather recording console. Used for both 449 advance irrigation water management and for Activity 202 water quality monitoring .	Each	$811.13	1	$811.13

Practice: 449 - Irrigation Water Management

Scenario: #10 - Advanced Weather Station and Soil Moisture Sensors Years 2+

Scenario Description:

Description: This scenario includes the engineering consultation services labor to analyze data and make and implement irrigation management recommendations using the equipment installed under the Advanced Weather Station and Soil Moisture Monitoring Year 1 scenario. Data sources include an advanced weather station, soil moisture sensors with data loggers, flow meters, etc. It is assumed that an engineer or other water resources professional will provide the data analysis services. Assumed management scenario size is 160 acres. Resource Concerns: Insufficient Water- Inefficient use of irrigation water. Associated Practices Include: 449- Irrigation Water Management; 441- Irrigation System, Microirrigation; 442- Irrigation System, Sprinkler; 443- Irrigation System, Surface; and 587, Structure for Water Control.

Before Situation:

An advanced weather station and soil moisture sensors with a telemetry system has been installed in a previous year.

After Situation:

Engineering consultants hired by the producer analye data collected by the previously installed equipment and make irrigation recommendations and evaluate water resources data. Service results in improved irrigation water management and optimally scheduled irrigations.

Feature Measure: Irrigated Area Managed

Scenario Unit: Acres

Scenario Typical Size: 160.0

Scenario Total Cost: $5,009.60

Scenario Cost/Unit: $31.31

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	32	$1,450.88
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	32	$3,558.72

Practice: 450 - Anionic Polyacrylamide (PAM) Application

Scenario: #1 - PAM Application

Scenario Description:

Control of irrigation induced erosion (typically in furrow irrigated fields) through the direct application of water-soluble Polyacrylamide (PAM) into the irrigation water supply (1 to 3 ounce sprinkled at 3-5 ft furrow inlet or metered at 10 ppm directly into the head ditch). PAM comes in granular, liquid oil emulsion, tablet, and block forms. This typical application is for an 80-acre furrow irrigated row crop field, with one PAM application (1-1.5 lb/ac, creating a 10 ppm concentration of the granular PAM in the head ditch metered via large fish feeder) at first irrigation followed by two additional applications (reduced rates of 0.5-1 lb/ac, or about 1-5 ppm in the inflow water) after cultivations. Resource Concern: Soil erosion. Associated Practices: 443-Irrigation System, Surface and Subsurface, 449-Irrigation Water Management.

Before Situation:

Irrigated lands susceptible to irrigation-induced erosion, excluding peat soils, and where the sodium adsorption ratio (SAR) of irrigation water is less than 15.

After Situation:

Erosion is minimized in furrow irrigated field.

Feature Measure: Weight of PAM Applied

Scenario Unit: Pound

Scenario Typical Size: 240.0

Scenario Total Cost: $1,574.28

Scenario Cost/Unit: $6.56

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	12	$290.28
Materials						
Anionic Polyacrylamide (PAM)	1279	Water Soluble PAM, granular bulk, for mixing with irrigation water. Includes materials and shipping only.	Pound	$5.35	240	$1,284.00

Practice: 460 - Land Clearing

Scenario: #1 - Minor Shaping

Scenario Description:

The land surface is shaped or leveled to a specific elevation and grade for various land uses. Cuts and fills are small. The resource concerns are EXCESS / INSUFFICIENT WATER -(Ponding, Flooding) and SOIL EROSION -(Sheet, Rill)

Before Situation:

The field has minor topographic issues or problems with surface drainage or erosion which can be corrected without land leveling or land smoothing. Site conditions require attention to elevation and grade. Typical situation is a 5 acre field. Material to be moved and or placed typically around 100 cubic yards per acre.

After Situation:

Land has been shaped to the required elevations and grades. Resource concerns have been treated. Associated practices, like plantings or drainage water management practices, would be contracted seperately as needed.

Feature Measure: Acres of land treated

Scenario Unit: Acres

Scenario Typical Size: 5.0

Scenario Total Cost: $2,049.15

Scenario Cost/Unit: $409.83

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$96.65	6	$579.90
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.72	6	$304.32
Scraper, pull, 7 CY	1206	Pull type earthmoving scraper with 7 CY capacity. Does not include pulling equipment or labor. Add Tractor or Dozer, 160 HP typically required for single scraper.	Hours	$16.20	6	$97.20
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	6	$158.76
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	6	$201.84
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	3	$707.13

Practice: 460 - Land Clearing

Scenario: #2 - Site Stabilization

Scenario Description:

The site contains a gully or other site specific topographic problem. Site conditions require attention to elevation and grade. Resource concerns are EXCESS / INSUFFICIENT WATER -(Ponding, Flooding) and SOIL EROSION -(Sheet, Rill)

Before Situation:

The site, commonly a crop field or CAFO, has localized gully or topographic issues causing drainage or erosion problems. Typical situation is a gully 10 feet wide and 5 feet deep.

After Situation:

Land has been shaped to the required elevations and grades. Resource concerns have been treated. Associated practices, like plantings or drainage water management practices, would be contracted seperately as needed.

Feature Measure: Cubic yards of material placed

Scenario Unit: Cubic Yards

Scenario Typical Size: 6,000.0

Scenario Total Cost: $12,715.71

Scenario Cost/Unit: $2.12

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	6000	$12,480.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 464 - Irrigation Land Leveling

Scenario: #1 - Irrigation Land Leveling

Scenario Description:

This scenario will level 80 acres of irrigated crop land to a planned grade to permit uniform and efficient application of irrigation water to the leveled land. Equipment used include dirtpans/carry-all/pan-scraper equipment that are typcially laser or GPS guided. The typical volume of earth moved is 100 to 700 cubic yards per acre. Resource Concern: Excess/Insufficient - Inefficient Use of Irrigation Water Associated Conservation Practices: 433 - Irrigation System, Surface and Subsurface; 607 - Surface Drain, Field Ditch; 388 - Irrigation Field Ditch; 449 - Irrigation Water Management; or 587 - Structure for Water Control.

Before Situation:

Irregular field surface reduces uniformity of surface application and reduced irrigation efficiency by localized ponding, excessive deep percolation, and/or excess runoff/runon.

After Situation:

Cropland will be reshaped to provide uniform distribution of irrigation water in promote efficient use of irrigation water and achieve designed irrigation efficiencies.

Feature Measure: Volume of Earth Moved

Scenario Unit: Cubic Yards

Scenario Typical Size: 52,000.0

Scenario Total Cost: $111,760.24

Scenario Cost/Unit: $2.15

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	52000	$108,160.00
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	8	$3,600.24

Practice: 464 - Irrigation Land Leveling

Scenario: #2 - Irrigation Land Leveling Remote

Scenario Description:

This scenario will level 80 acres of irrigated crop land in remote loactions (>50 miles from equipment source) to a planned grade to permit uniform and efficient application of irrigation water to the leveled land. Equipment used include dirtpans/carry-all/pan-scraper equipment that are typcially laser or GPS guided. The typical volume of earth moved is 400 to 700 cubic yards per acre. Typically, Fields have been rough leveled and have excessive row and side fall. Earth moving, using a guided system, involves higher yardage amounts. Field locations are remote and require transport of equipment at distances of 50 miles or greater. Resource Concern: Excess/Insufficient - Inefficient Use of Irrigation Water Associated Conservation Practices: 433 - Irrigation System, Surface and Subsurface; 607 - Surface Drain, Field Ditch; 388 - Irrigation Field Ditch; 449 - Irrigation Water Management; or 587 - Structure for Water Control.

Before Situation:

Irregular field surface reduces uniformity of surface application and reduced irrigation efficiency by localized ponding, excessive deep percolation, and/or excess runoff/runon. Field locations are remote requiring transport of equipment 50 miles or greater.

After Situation:

Cropland will be reshaped to provide uniform distribution of irrigation water in promote efficient use of irrigation water and achieve designed irrigation efficiencies.

Feature Measure: Volume of earth moved

Scenario Unit: Cubic Yards

Scenario Typical Size: 52,000.0

Scenario Total Cost: $118,960.72

Scenario Cost/Unit: $2.29

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	52000	$108,160.00
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	24	$10,800.72

Practice: 466 - Land Smoothing

Scenario: #1 - Minor Shaping

Scenario Description:
Removing irregularities on the land surface of cropland by use of heavy equipment.

Before Situation:
Field damaged by flooding, past agricultural practices, or other topographich issues causing drainage or field workablity issues. Typically less than 100 cy/acre material moved. Resource Concerns include Soil Condition, Soil Erosion, and Water Quality/Quantity.

After Situation:
Scraper, backhoe, bulldozer or other heavy equipment used to correct irregulaties and address drainage or workablity issues. Soil condition and erosion concerns are addressed, and water quality is improved in nearby waterways and streams.

Feature Measure: Acres of land treated

Scenario Unit: Acres

Scenario Typical Size: 40.0

Scenario Total Cost: $3,662.25

Scenario Cost/Unit: $91.56

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$96.65	25	$2,416.25
Scraper, pull, 7 CY	1206	Pull type earthmoving scraper with 7 CY capacity. Does not include pulling equipment or labor. Add Tractor or Dozer, 160 HP typically required for single scraper.	Hours	$16.20	25	$405.00
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	25	$841.00

Practice: 468 - Lined Waterway or Outlet

Scenario: #1 - Turf Reinforced Matting

Scenario Description:

Install 300 ' long by 15' wide by 1.5' deep trapezoidal or parabolic shaped waterway lined with Turf Reinforced Matting (TRM). 1/2 the channel is excavated. Excess excavation is spoiled in the immediate area. TRM is installed over 100% of the width of the waterway to prevent scour and aid in waterway establishment. Cost include excavation, spoiling of excess material, and furnishing and installing TRM. Lined waterway width is measured from top of bank to top of bank.

Before Situation:

Excessive sedimentation and soil erosion as a result of ephemeral or classic gully erosion. Velocities are generally too high or saturated soil conditions make it difficult to establish a grassed waterway.

After Situation:

TRM lined waterway is 300 ' long by 15' wide by 1.5' deep. The practice is installed using a hydraulic excavator. TRM is installed by laborers. Associated practices are Subsurface Drain (606), Underground Outlet (620), Structure for Water Control (587), and Critical Area Seeding (342).

Feature Measure: Square Foot of Waterway

Scenario Unit: Square Feet

Scenario Typical Size: 4,500.0

Scenario Total Cost: $7,575.59

Scenario Cost/Unit: $1.68

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	90	$187.20
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	2	$90.68
Materials						
Turf reinforcement mat	1212	Synthetic turf reinforcement mat with staple anchoring. Includes materials, equipment and labor.	Square Yard	$13.20	535	$7,062.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 468 - Lined Waterway or Outlet

Scenario: #2 - Rock Lined - 12 inch

Scenario Description:

Install 300 ' long by 15' wide by 1.5' deep trapezoidal or parabolic shaped waterway lined with riprap (D100 = 9", Velocity ~ 8 ft/sec). 1/2 the channel is excavated, before excavation for riprap. Excess excavation is spoiled in the immediate area. Riprap is installed over 100% of the width of the waterway to prevent scour. Cost include excavation, spoiling of excess material, geotextile underlayment and installing 9" Rock Riprap. Lined waterway width is measured from top of bank to top of bank.

Before Situation:

Excessive sedimentation and soil erosion as a result of ephemeral or classic gully erosion. Velocities are generally too high or saturated soil conditions make it difficult to establish a grassed waterway.

After Situation:

Rock lined waterway is 300 ' long by 15' wide by 1.5' deep. Waterway is excavated and rock is placed using a hydraulic excavator. Geotextile underlayment is installed by laborers. Associated practices are Subsurface Drain (606), Underground Outlet (620), Structure for Water Control (587), and Critical Area Seeding (342).

Feature Measure: Square Foot of Waterway

Scenario Unit: Square Feet

Scenario Typical Size: 4,500.0

Scenario Total Cost: $18,273.97

Scenario Cost/Unit: $4.06

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	295	$613.60
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	2	$48.38
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	2	$90.68
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic Yards	$84.32	205	$17,285.60
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 468 - Lined Waterway or Outlet

Scenario: #3 - Rock Lined - 24 inch

Scenario Description:

Install 300 ' long by 15' wide by 1.5' deep trapezoidal or parabolic shaped waterway lined with riprap (D100 = 18", Velocity ~ 11 ft/sec). 1/2 the channel is excavated, before excavation for riprap. Excess excavation is spoiled in the immediate area. Riprap is installed over 100% of the width of the waterway to prevent scour. Cost include excavation, spoiling of excess material, geotextile underlayment and installing 18" Rock Riprap. Lined waterway width is measured from top of bank to top of bank.

Before Situation:

Excessive sedimentation and soil erosion as a result of ephemeral or classic gully erosion. Velocities are generally too high or saturated soil conditions make it difficult to establish a grassed waterway.

After Situation:

Rock lined waterway is 300 ' long by 15' wide by 1.5' deep. Waterway is excavated and rock is placed using a hydraulic excavator. Geotextile underlayment is installed by laborers. Associated practices are Subsurface Drain (606), Underground Outlet (620), Structure for Water Control (587), and Critical Area Seeding (342).

Feature Measure: Square Foot of Waterway

Scenario Unit: Square Feet

Scenario Typical Size: 4,500.0

Scenario Total Cost: $40,737.97

Scenario Cost/Unit: $9.05

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	555	$1,154.40
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	2	$48.38
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	2	$90.68
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic Yards	$84.32	465	$39,208.80
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 468 - Lined Waterway or Outlet

Scenario: #4 - Concrete

Scenario Description:

Install 300 ' long by 15' wide by 1.5' deep trapezoidal or parabolic shaped waterway lined with concrete. 1/2 the channel is excavated, before excavation for concrete and subgrade material. Excess excavation is spoiled in the immediate area. Concrete is installed over 100% of the width of the waterway to prevent scour. Cost include excavation, spoiling of excess material, 6" of clean sand or gravel subgrade, and 5" reinforced concrete slab. Lined waterway width is measured from top of bank to top of bank.

Before Situation:

Excessive sedimentation and soil erosion as a result of ephemeral or classic gully erosion. Velocities are generally too high or saturated soil conditions make it difficult to establish a grassed waterway. Usually installed in locations where rock or other lining materials are not readily available.

After Situation:

Concrete lined waterway is 300 ' long by 15' wide by 1.5' deep. Waterway is excavated using a hydraulic excavator. Concrete slab is placed on 6" of clean sand or #57 stone. Concrete is placed, graded and screeded by laborers. Associated practices are Subsurface Drain (606), Underground Outlet (620), Structure for Water Control (587), and Critical Area Seeding (342).

Feature Measure: Square Foot of Waterway

Scenario Unit: Square Feet

Scenario Typical Size: 4,500.0

Scenario Total Cost: $34,053.67

Scenario Cost/Unit: $7.57

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$372.36	80	$29,788.80
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	280	$582.40
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	2	$48.38
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	2	$90.68
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	110	$3,307.70
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 468 - Lined Waterway or Outlet

Scenario: #5 - Membrane

Scenario Description:

Install 300 ' long by 15' wide by 1.5' deep trapezoidal or parabolic shaped waterway lined with a synthetic membrane. 1/2 the channel is excavated. Excess excavation is spoiled in the immediate area. Membrane is installed over 100% of the width of the waterway to prevent scour. Cost include excavation, spoiling of excess material, and furnishing and installing synthetic membrane and geotextile underlayment. Lined waterway width is measured from top of bank to top of bank.

Before Situation:

Excessive sedimentation and soil erosion as a result of ephemeral or classic gully erosion. Velocities are generally too high or saturated soil conditions make it difficult to establish a grassed waterway. Usually installed in locations where rock or other lining materials are not readily available.

After Situation:

Membrane lined waterway is 300 ' long by 15' wide by 1.5' deep. The practice is installed using a hydraulic excavator. Membrane liner and geotextile underlayment is installed by laborers. Associated practices are Subsurface Drain (606), Underground Outlet (620), Structure for Water Control (587), and Critical Area Seeding (342).

Feature Measure: Square Foot of Waterway

Scenario Unit: Square Feet

Scenario Typical Size: 4,500.0

Scenario Total Cost: $31,728.82

Scenario Cost/Unit: $7.05

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.37	535	$732.95
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	90	$187.20
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	12	$290.28
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	2	$90.68
Materials						
Synthetic Liner, 40 mil	1387	Synthetic 40 mil HDPE, LLDPE, EPDM, etc membrane liner material. Includes materials and shipping only.	Square Yard	$6.29	4800	$30,192.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 468 - Lined Waterway or Outlet

Scenario: #6 - Concrete Block

Scenario Description:

Install 36' long (including inlet and outlet aprons) by 15' wide by 1.5' deep trapezoidal shaped waterway or chute lined with concrete blocks. 1/2 the channel is excavated. Excess excavation is spoiled in the immediate area. 8"x8"x16" standard concrete blocks are installed over 100% of the width of the waterway/chute to prevent scour. Cost include excavation, spoiling of excess material, 3" stone subgrade, geotextile and furnishing and installing standard concrete blocks. Lined waterway width is measured from top of bank to top of bank.

Before Situation:

Excessive sedimentation and soil erosion as a result of ephemeral or classic gully erosion. Velocities are generally too high or saturated soil conditions make it difficult to establish a grassed waterway. Usually installed in locations where rock or other lining materials are not readily available.

After Situation:

Conccrete block lined waterway or chute is 36 ' long by 15' wide by 1.5' deep. Chute is installed on a 3 to 1 slope. The practice is installed using a hydraulic excavator. Geotextile and concrete blocks are installed by laborers. Associated practices are Subsurface Drain (606), Underground Outlet (620), Structure for Water Control (587), and Critical Area Seeding (342).

Feature Measure: Square Foot of Waterway

Scenario Unit: Square Feet

Scenario Typical Size: 540.0

Scenario Total Cost: $2,862.18

Scenario Cost/Unit: $5.30

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.37	65	$89.05
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	32	$66.56
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	24	$580.56
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	2	$90.68
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	6	$180.42
Block, concrete	253	Concrete block, hollow, normal weight, 3500 psi. Includes both full and partial sizes. Material only	Each	$2.53	640	$1,619.20
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 472 - Access Control

Scenario: #1 - Trails/Roads Access Control

Scenario Description:

Restricting access to the use of forest/farm roads and trails by the use of a gate and limited fencing. Resource concerns include Undesirable plant productivity and health, Concentrated flow erosion, Soil compaction, Excessive sediment in surface waters, and Wildlife habitat degradation.

Before Situation:

Roads are damaged or misused, illegal activities occur and/or forest resources are at risk. Extensive amount of fencing (other than that needed to restrict access at the site of ingress) is not included in this scenario, but instead will be planned and installed with the Fence practice (382).

After Situation:

Roads are protected, illegal activities are stopped and/or forest resources are secure.

Feature Measure: Number

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $612.42

Scenario Cost/Unit: $612.42

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hours	$11.75	2	$23.50
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	4	$89.16
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$21.30	4	$85.20
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	4	$96.76
Materials						
Post, Wood, CCA treated, 3-4 in. x 7 ft.	9	Wood Post, Line 3-4 inch dia. X 7 ft., CCA Treated. Includes materials and shipping only.	Each	$7.36	4	$29.44
Post, Wood, CCA treated, 6 in. x 8 ft.	12	Wood Post, End 6 inch dia. X 8 ft., CCA Treated. Includes materials and shipping only.	Each	$17.21	4	$68.84
Gate, Pipe, 12 ft.	1057	6 rail tube gate, 16 gauge. Includes materials and shipping only.	Each	$179.02	1	$179.02
Concrete mix, bag	1226	Pre-mixed dry concrete mix in 60 pound bag. Materials only.	Each	$4.05	10	$40.50

Practice: 472 - Access Control

Scenario: #2 - Animal exclusion from sensitive areas

Scenario Description:

Excluding animals from an area in order to address identified resource concerns. This is for facilitating exclusion of animals to protect or enhance natural resource values. Control will be by temporary electric fencing. Any need for permanent fencing will be planned and installed using the Fence practice (382). Clearing of brush and trees is not necessary. Resource concerns include Wildlife Habitat degradation, Undesirable plant productivity and health, and/or Excessive sediment in surface waters.

Before Situation:

Sensitive areas are threatened by the adverse actions of domestic and/or wild animals. The importance of the sensitive areas can include (but are not limited to): wildlife habitat, plant species composition, newly established trees and/or plants, stream bank stability, and/or water quality.

After Situation:

Sensitive areas are protected from the adverse actions of domestic and/or wild animals by excluding them from the area.

Feature Measure: Length of fence

Scenario Unit: Feet

Scenario Typical Size: 3,600.0

Scenario Total Cost: $430.73

Scenario Cost/Unit: $0.12

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	4	$89.16
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	4	$96.76
Materials						
Post, Wood, CCA treated, 4 in x 8 ft	10	Wood Post, Line 4 inch X 8 foot, CCA Treated. Includes materials and shipping only.	Each	$9.67	4	$38.68
Property/Safety Signs	293	Plastic Fence safety or property sign - Printed on both sides 6 pre-drilled holes for hanging or nailing. 7.5 x 4.75 inch. Includes materials and shipping only.	Each	$1.36	35	$47.60
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53

Practice: 472 - Access Control

Scenario: #3 - Forest/Farm Access Control

Scenario Description:

Restricting human access to a field/farm/property through use of signage and other markings. Resource concerns include Undesirable plant productivity and health, Excessive sediment in surface waters, Concentrated flow erosion, and Wildlife habitat degradation.

Before Situation:

A 20 acre tract (field, farm. forests, etc.) is being damaged or misused by illegal activities that put the resources/property at risk or needs controlled access due to an active management operation such as pest management or timber harvesting. The perimeter needs marking with paint (at 100 foot intervals) and signs at points of ingress. Surveying is not necessary.

After Situation:

The property is adequately marked and protected, illegal activities are stopped and/or forest resources are secure.

Feature Measure: <Unknown>

Scenario Unit: Feet

Scenario Typical Size: 3,500.0

Scenario Total Cost: $462.36

Scenario Cost/Unit: $0.13

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	8	$178.32
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	8	$193.52
Materials						
Property/Safety Signs	293	Plastic Fence safety or property sign - Printed on both sides 6 pre-drilled holes for hanging or nailing. 7.5 x 4.75 inch. Includes materials and shipping only.	Each	$1.36	2	$2.72
Tree Marking Paint	313	Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only.	Acres	$8.78	10	$87.80

Practice: 472 - Access Control

Scenario: #4 - Monitoring, maintenance, additional labor

Scenario Description:

Labor and increased time needed to control and re-route animals and traffic from sensitive areas, monitor and maintain barriers. Resource concerns include Excessive sediment in surface waters, Habitat degradation for fish and wildlife, and Undesirable plant productivity and health.

Before Situation:

The application of access control has resulted in increased labor and time to re-route traffic and animals from a riparian area that splits a field in half. This has also lead to more time and labor in monitoring the animals, inspecting and repairing the barrier.

After Situation:

Water quality is maintained, habitat is improved, and plant health is maintained by controlling access to the riparian area.

Feature Measure: Area of riparian area

Scenario Unit: Acres

Scenario Typical Size: 5.0

Scenario Total Cost: $139.44

Scenario Cost/Unit: $27.89

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	3	$66.87
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	3	$72.57

Practice: 484 - Mulching

Scenario: #1 - Organic Material

Scenario Description:

Application of straw mulch or other other state approved natural material to reduce erosion and facilitate the establishment of vegetative cover. Mulch provides full coverage and is typically used with Critical Area Planting. Resource Concern: Soil Erosion

Before Situation:

Typical scenario ranges is a 1.0 acre disturbed site around a newly constructed structural practice. The potential for soil erosion is high and mulch is needed to stabilize the soil and facilitate the establishment of vegetative cover.

After Situation:

Straw mulch has been applied to areas needing mulch. Erosion and sedimentation is reduced, water and soil quality is protected, and vegetative cover is established.

Feature Measure: Area Covered by Mulch

Scenario Unit: Acres

Scenario Typical Size: 1.0

Scenario Total Cost: $184.61

Scenario Cost/Unit: $184.61

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	0.5	$11.15
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$21.30	0.5	$10.65
Mulcher, straw blower	1305	Straw bale mulcher/blower to mechanically spread small or large straw bales. Labor not included.	Hours	$41.44	0.5	$20.72
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	0.5	$12.10
Materials						
Straw	1237	Small grain straw (non organic and certified organic). Includes materials only.	Ton	$65.00	2	$130.00

Practice: 484 - Mulching

Scenario: #2 - Erosion Control Blanket

Scenario Description:

Installation of erosion control blanket on critical areas with steep slopes, or disturbed site around a newly constructed structural practice such as a grassed waterway. Blanket is typically made of coconut coir, wood fiber, straw and is typically covered on both sides with polypropylene netting. Used to help control erosion and establish vegetative cover.

Before Situation:

There are areas of concentrated flow or overland flow which require shaping or other earthwork practice installation. Soil erosion is a concern and there is little to no vegetation.

After Situation:

The erosion control blanket is placed on concentrated flow areas and secured with ground stables. Soil erosion is minimized and vegetative cover is established.

Feature Measure: Area Covered by Mulch

Scenario Unit: Square Feet

Scenario Typical Size: 5,000.0

Scenario Total Cost: $927.44

Scenario Cost/Unit: $0.19

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	8	$193.52
Materials						
Erosion Control Blanket, biodegradable	1213	Biodegradable erosion control blanket, typically a composite of natural fibers with reinforcing polymer netting. Materials and shipping only.	Square Yard	$1.32	556	$733.92

Practice: 484 - Mulching

Scenario: #3 - Synthetic Material

Scenario Description:

Installation of geotextile, biodegradable plastic, polyethylene plastic, or other state approved synthetic mulch to conserve soil moisture, facilitate plant etablishment and provide erosion control. Payment based on actual area covered by mulching material.

Before Situation:

Site conditions very. Typically scenarios include new tree and shrub plantings, irrigated orchards, vineyards, or specialty crops. Water quantity and plant condition are concerns.

After Situation:

Synthetic mulch is applied in rows with a mulch layer or by other mechanized means. Soil moisture is conserved, energy use associated with irrigation is decreased.

Feature Measure: Linear Feet Covered by Mulch

Scenario Unit: Feet

Scenario Typical Size: 1,000.0

Scenario Total Cost: $913.79

Scenario Cost/Unit: $0.91

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.37	667	$913.79

Practice: 484 - Mulching

Scenario: #4 - Tree and Shrub squares

Scenario Description:

Weed barrier fabric or other suitable natural or synthetic mulch is installed with a new tree and shrub planting. Typically used to conserve soil moisture to facilitate tree/shrub establishment. Rate is per tree/shrub and assumes 1 square yard of weed barrier fabric and 5 staples/tree.

Before Situation:

Site conditions vary. Typical scenario is an installation of 100 native trees and shrubs to enhance wildlife habitat. Sites are often remote and trees may not be planted in rows, requiring each tree to be mulched individually. Water quantity and plant condition are concerns.

After Situation:

Weed barrier fabric squares are installed with 5 sod staples each, around individual trees and shrubs to conserve soil moisture and facilitate tree/shrub establishment.

Feature Measure: Number of Trees Mulched

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $1.37

Scenario Cost/Unit: $1.37

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.37	1	$1.37

Practice: 484 - Mulching

Scenario: #54 - Natural Material - Partial Coverage

Scenario Description:

Application of straw mulch or other other state approved natural material (such as wood chips, compost, or hay) to reduce erosion, moderate soil temperature and suppress weeds. Typically used to provide partial coverage (either in-row or between rows) to suppress weeds. Payment based on total acres mulched, assuming 3-5 ft. swatch and 10-12 ft. row spacing.

Before Situation:

Site conditions vary. Typically scenarios include new tree and shrub plantings, irrigated orchards or vineyards, or annual and perennial specialty crops. Water quantity and soil moisture is a concern.

After Situation:

Implementation Requirements are preprared according to the 484 Mulching Standard and implemented. Straw or other natural mulch is applied in rows by hand or by mechanized means. Soil moisture is conserved, energy use associated with irrigation is decreased, and weed growth is suppressed.

Feature Measure: Total Acres Mulched

Scenario Unit: Acres

Scenario Typical Size: 10.0

Scenario Total Cost: $368.80

Scenario Cost/Unit: $36.88

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$21.30	5	$106.50
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	5	$132.30
Materials						
Straw	1237	Small grain straw (non organic and certified organic). Includes materials only.	Ton	$65.00	2	$130.00

Practice: 484 - Mulching

Scenario: #55 - Natural Material - Full Coverage

Scenario Description:

Application of straw mulch or other other state approved natural material to reduce erosion and facilitate the establishment of vegetative cover. Mulch provides full coverage and is typically used with critical area planting. Assumes 2 tons of straw mulch per acre

Before Situation:

Typical scenario ranges from a 0.1 to 1.0 acre disturbed site around a newly constructed structural practice. The potential for soil erosion is high and mulch is needed to stabilize the soil and facilitate the establishment of vegetative cover.

After Situation:

Implementation Requirements are preprared according to the 484 Mulching Standard and implemented. Straw mulch has been applied to areas needing mulch. Erosion and sedimentation is reduced, water and soil quality is protected, and vegetative cover is established.

Feature Measure: Area Covered by Mulch

Scenario Unit: Acres

Scenario Typical Size: 1.0

Scenario Total Cost: $383.05

Scenario Cost/Unit: $383.05

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	0.5	$11.15
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	10	$241.90
Materials						
Straw	1237	Small grain straw (non organic and certified organic). Includes materials only.	Ton	$65.00	2	$130.00

Practice: 490 - Tree/Shrub Site Preparation

Scenario: #1 - Mechanical - Heavy

Scenario Description:

This practice involves the use of heavy machinery to create site conditions suitable for establishing desirable trees and/or shrubs. Typical sites are mainly covered with trees and brush that are not appropriate for the eco-site and do not meet the landowner's desired condition; however, some portions of the site do not need treatment. Two large machines work in tandem to cut or uproot undesirable vegetation, and to move debris so the establishment of desirable trees and/or shrubs will not be impeded. Many sites also require soil loosening and surface shaping. Size of the treatment area can be less than or equal to 40 acres. Within the treatment area, there may be as much as 40% of the site (16 acres) that does not require shearing and/or raking. Resource concerns include: Degraded Plant Condition - Undesirable plant productivity and health, Inadequate structure and composition, and (on some sites) Wildfire Hazard, Excessive Biomass Accumulation; Soil Erosion - Concentrated flow erosion, Ephemeral gully erosion, and Classic gully erosion; Fish and Wildlife - Inadequate Habitat - Cover/Shelter, and Food; and, Water Quality - Excessive sediment in surface waters.

Before Situation:

The site is dominated by undesirable vegetation including significant coverage of trees and brush, some of which may be noxious and/or invasive species. There may also be a significant component of woody residue onsite. Soils in some parts of the site may be compacted due to past heavy equipment activities or from other land uses. Soil erosion and sedimentation may be ocurring in areas of severe soil disturbance. Without a site preparation treatment, desired tree/shrub species cannot be established, undesirable species will continue to dominate the site, and soil compaction and erosion/sedimentation problems will persist.

After Situation:

Following treatment, undesirable vegetation has been removed using mechanical methods. Woody residue has been moved to facilitate tree and/or shrub planting operations. Soil compaction has been alleviated, improving soil moisture and aeration for good growth. Soil erosion problems have been corrected and there is no sediment entering water bodies. Site conditions are favorable for the successful establishment of desired trees and/or shrubs.

Feature Measure: Area of Treatment

Scenario Unit: Acres

Scenario Typical Size: 40.0

Scenario Total Cost: $8,078.82

Scenario Cost/Unit: $201.97

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Heavy mechanical site prep, shearing, V-blade, K-G blading	1314	Mechanical operations that shear trees and vegetation. Requires heavy equipment such as dozers, Includes equipment, power unit and labor costs.	Acres	$139.28	24	$3,342.72
Heavy mechanical site prep, raking	1317	Mechanical operations that pushing and raking trees and vegetation. Requires heavy equipment such as dozers. Includes equipment, power unit and labor costs.	Acres	$150.74	24	$3,617.76
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	8	$193.52
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	10	$453.40
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 490 - Tree/Shrub Site Preparation

Scenario: #2 - Mechanical - Light

Scenario Description:

This practice involves the use of light/moderate machinery to clear above ground vegetation and to also rip/cut/lift underground root systems in order to improve site conditions for establishing trees and/or shrubs. Typical sites include abandoned fields, pastures, rangelands, agricultural fields or forestlands that have been harvested. This following resource concerns: soil quality degredation - compaction, soil erosion - sheet and rill, and degraded plant condition - undesirable plant productivity and health and inadequate structure and composition.

Before Situation:

Undesirable vegetation is present on the site including herbaceous plants and sparse woody competition. Noxious and invasive species may also be present on the site. If left uncontrolled, undesirable vegetation will inhibit successful establishment of target species of trees and/or shrubs. Soils are compacted as a result of harvesting heavy equipment activities or other land uses.

After Situation:

Undesirable vegetation has been removed using a bush hog to knock down stand vegetation and heavy tillage equipment is used to breakup and lift root systems, breakup plow pans (<18" deep), thus enhancing the conditions for planting and survival of trees and/or shrubs. Soil compaction has been alleviated, allowing penetration of moisture and allowing roots to grow properly. Site conditions are favorable for successful establishment of trees and/or shrubs. The typical size of the practice is 40 acres.

Feature Measure: Area of Treatment

Scenario Unit: Acres

Scenario Typical Size: 40.0

Scenario Total Cost: $3,458.99

Scenario Cost/Unit: $86.47

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hours	$46.50	20	$930.00
Site Preparation, Mechanical	944	Aerator, rolling drum chopper, etc. Includes equipment, power unit and labor costs.	Acres	$59.17	10	$591.70
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acres	$15.10	30	$453.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	5	$120.95
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	20	$529.20
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	8	$362.72
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 490 - Tree/Shrub Site Preparation

Scenario: #3 - Chemical - Ground Application

Scenario Description:

This practice involves the use of various herbicides applied using ground-based machinery in order to remove undesirable vegetation and improve site conditions for establishing trees and/or shrubs. Typical sites include abandoned fields, pastures, rangelands, agricultural fields or forestland that was recently harvested. This practice is typically used to address the following resource concerns: degraded plant condition - undesirable plant productivity and health and inadequate structure and composition.

Before Situation:

Undesirable vegetation is present on the site including herbaceous plants and woody vegetation. Noxious and invasive species may also be present on the site. If left uncontrolled, undesirable vegetation will inhibit successful establishment of target species of trees and/or shrubs.

After Situation:

Undesirable vegetation has been treated using appropriate herbicides, reducing competition for target trees and/or shrubs. Site conditions are favorable for successful establishment of trees and/or shrubs. The typical size of the practice is 40 acres.

Feature Measure: Area of Treatment

Scenario Unit: Acres

Scenario Typical Size: 40.0

Scenario Total Cost: $5,670.91

Scenario Cost/Unit: $141.77

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, ground application, forested land	1313	Chemical application performed by ground equipment where trees and terrain impede passage of wide boom sprayers. Utilizes forestry application methods that include heavy equipment such as skidders. Includes material, equipment, power unit and labor costs.	Acres	$102.49	40	$4,099.60
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	20	$906.80
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$9.21	40	$368.40
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$1.51	40	$60.40
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 490 - Tree/Shrub Site Preparation

Scenario: #5 - Chemical - Hand Application

Scenario Description:

This practice involves the use of various herbicides applied using backpack sprayer or similar equipment, and hack-n-squirt for tree control, in order to remove undesirable vegetation and improve site conditions for establishing trees and/or shrubs. Typical sites include lands such as old fields, pastures, rangelands, agricultural fields, previous forestlands that have been abandoned and are now covered with a mixture of grasses, forbs, shrubs and some remnant trees. Resource concerns are: degraded plant condition - undesirable plant productivity and health and inadequate structure and composition.

Before Situation:

Undesirable vegetation, including woody and herbaceous plants, occupy 100 % of the on the site. Noxious and invasive species may also be present on the site. If left uncontrolled, undesirable vegetation will inhibit successful establishment of target species of trees and/or shrubs.

After Situation:

Undesirable vegetation has been treated using appropriate herbicides, reducing competition for target trees and/or shrubs. Site conditions are favorable for successful establishment of trees and/or shrubs. The typical size of the practice is 40 acres.

Feature Measure: area of treatment

Scenario Unit: Acres

Scenario Typical Size: 40.0

Scenario Total Cost: $3,829.28

Scenario Cost/Unit: $95.73

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hours	$66.08	40	$2,643.20
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	10	$453.40
Materials						
Herbicide, 2,4-D + Dica	331	Broadleaf herbicide labeled for cropland and pasture. Refer to WIN-PST for product names and active ingredients. Materials and shipping.	Acres	$12.60	40	$504.00
Herbicide, Imazapyr	336	Pre and post-emergent, non-selective herbicide for control of undesirable vegetation in non-crop areas. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$42.07	4	$168.28
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$1.51	40	$60.40

Practice: 490 - Tree/Shrub Site Preparation

Scenario: #6 - Hand site preparation

Scenario Description:

This practice typically involves grubbing all vegetation from the area of ground prior to the establishment of trees and/or shrubs. Typical sites include land such as old fields, pastures, rangelands, agricultural fields, or abandoned forests that are mostly grass or weed covered. This practice is typically used to address the following resource concerns: degraded plant condition - undesirable plant productivity and health and inadequate structure.

Before Situation:

The site contains undesirable vegetation including herbaceous and woody plants. Noxious and invasive species may also be present on the site. If left uncontrolled, undesirable vegetation will inhibit successful establishment of target species of trees and/or shrubs. Soils are compacted as a result of recent timber harvesting activities or other land uses. If left untreated poor survival or reduced growth of trees/shrubs will occur and wildlife habitat conditions will not improve.

After Situation:

All undesirable vegetation has been grubbed out of a 1 ft by 1 ft area, leaving bare soil, at each planting spot. Typical tree spacing would be about 8 feet (680 trees per acre). Tree seedlings and/or shrubs are planted at each spot. Adequate moisture, space and light is available allowing plants to grow properly. Site conditions are favorable for successful establishment of trees and/or shrubs. The typical size is 10 acres.

Feature Measure: Area of Treatment

Scenario Unit: Acres

Scenario Typical Size: 10.0

Scenario Total Cost: $2,418.61

Scenario Cost/Unit: $241.86

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	55	$1,330.45
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	24	$1,088.16

Practice: 490 - Tree/Shrub Site Preparation

Scenario: #7 - Windbreak, mechanical only

Scenario Description:

This practice involves the use of various mechanical equipment in order to prepare a site for tree row planting and remove undesirable vegetation and improve site conditions for establishing trees and/or shrubs. Typical sites include abandoned fields, pastures, rangelands, or forestland that was recently harvested. This practice is typically used to address the following resource concerns: degraded plant condition - undesirable plant productivity and health, and inadequate structure and composition.

Before Situation:

Ground needs prepared for establishemnt of trees and shrubs in rows. Undesirable vegetation is present on the site including herbaceous plants and woody vegetation. Noxious and invasive species may also be present on the site. If left uncontrolled, undesirable vegetation will inhibit successful establishment of target species of trees and/or shrubs.

After Situation:

Ground has been prepare to establish tree and shrub rows. Undesirable vegetation has been treated using appropriate herbicides, reducing competition for target trees and/or shrubs. Site conditions are favorable for successful establishment of trees and/or shrubs. The typical size of the practice is 1.5 acres.

Feature Measure: Area of Treatment

Scenario Unit: Acres

Scenario Typical Size: 1.5

Scenario Total Cost: $139.52

Scenario Cost/Unit: $93.01

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	1.5	$14.84
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acres	$15.10	3	$45.30
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	3	$79.38

Practice: 490 - Tree/Shrub Site Preparation

Scenario: #8 - Windbreak, chemical and mechanical

Scenario Description:

This practice involves the use of various chemical/tillage methods to allow for the planting of a windbreak. Site preparation includes chemically killing vegegation prior to mechanical site preparation that includes appropriate methods to allow for planting of the site which may include one or all of the following, ripping, disking, and harrowing. This practice may be applied on all lands needing treatment to facilitate establishment of trees and/or shrubs to facilitate establishment of a windbreak. Typical sites include open land such as old fields, pastures, rangelands and agricultural fields. Resource concerns: Soil erosion--Wind erosion, .

Before Situation:

Undesirable vegetation, including woody and herbaceous plants, is present on the site. Noxious and invasive species may also be present on the site. If left uncontrolled, undesirable vegetation will inhibit successful establishment of target species of trees and/or shrubs. Soil is compacted as a result of prior land management activities.

After Situation:

Undesirable vegetation has been treated using appropriate herbicides, reducing competition for target trees and/or shrubs. Site conditions are favorable for successful establishment of trees and/or shrubs. The typical size is 1.5 acres.

Feature Measure: area of treatment

Scenario Unit: Acres

Scenario Typical Size: 1.5

Scenario Total Cost: $376.67

Scenario Cost/Unit: $251.11

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	1.5	$14.84
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acres	$15.10	1.5	$22.65
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	1.5	$8.01
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	3	$79.38
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$9.21	1.5	$13.82
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$1.51	1.5	$2.27
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 500 - Obstruction Removal

Scenario: #1 - Removal and Disposal of Brush and Trees < 6 inch Diameter

Scenario Description:

Remove and disposal of brush and trees < 6 inches in diameter by demolition, excavation or other means required for removal. Dispose of all brush and trees so that it does not impede subsequent work or cause onsite or offsite damage. Dispose of all brush and trees by removal to an approved landfill, wood chipping and or land distribution, or recycling center, burial at an approved location or burning. If burning is used, implement appropriate smoke management to protect public health and safety. Remove and dispose of brush and trees in order to apply conservation practices or facilitate the planned land use. Brush and tree removal will address the resource concerns of the prevention or hindrance to the installation of conservation practices or present a hazard to their use and enjoyment.

Before Situation:

On any land where existing obstructions interfere with planned land use development, public safety or infrastructure. The site may be abandoned mine lands, construction sites, recreation areas, farms, ranches, and areas affected by natural disasters. This is not intended for the removal of obstructions from aquatic environments.

After Situation:

The typical area will be a 2.0 acre impaired area. The removal of brush and trees < 6 inch diameter will be performed with the use of equipment and hand labor. Dispose of all brush and trees from the obstruction removal so that it does not impede subsequent work or cause onsite or offsite damage. Revegetate or otherwise protect from erosion disturbed areas as soon as possible. Refer to NRCS Conservation Practice Standard 342, Critical Area Planting for seedbed preparation, seeding, fertilizing, and mulching requirements. The practice is to improve site conditions in order to apply conservation practices or facilitate better use of the landscape.

Feature Measure: Land Area

Scenario Unit: Acres

Scenario Typical Size: 2.0

Scenario Total Cost: $2,089.63

Scenario Cost/Unit: $1,044.82

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$96.65	8	$773.20
Brush Chipper, 6 in. capacity	938	Brush Chipper, 6 inch capacity, typically 35 HP. Includes chipper and power unit. Labor not included.	Hours	$28.03	8	$224.24
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	8	$178.32
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	8	$272.96
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	8	$193.52
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	8	$211.68
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 500 - Obstruction Removal

Scenario: #2 - Removal and Disposal of Brush and Trees > 6 inch Diameter

Scenario Description:

Remove and disposal of brush and trees > 6 inches in diameter by demolition, excavation or other means required for removal. Dispose of all brush and trees so that it does not impede subsequent work or cause onsite or offsite damage. Dispose of all brush and trees by removal to an approved landfill, wood chipping and or land distribution, or recycling center, burial at an approved location or burning. If burning is used, implement appropriate smoke management to protect public health and safety. Remove and dispose of brush and trees in order to apply conservation practices or facilitate the planned land use. Brush and tree removal will address the resource concerns of the prevention or hindrance to the installation of conservation practices or present a hazard to their use and enjoyment.

Before Situation:

On any land where existing obstructions interfere with planned land use development, public safety or infrastructure. The site may be abandoned mine lands, construction sites, recreation areas, farms, ranches, and areas affected by natural disasters. This is not intended for the removal of obstructions from aquatic environments.

After Situation:

The typical area will be a 2.0 acre impaired area. The removal of brush and trees > 6 inch diameter will be performed with the use of equipment and hand labor. Dispose of all brush and trees from the obstruction removal so that it does not impede subsequent work or cause onsite or offsite damage. Revegetate or otherwise protect from erosion disturbed areas as soon as possible. Refer to NRCS Conservation Practice Standard 342, Critical Area Planting for seedbed preparation, seeding, fertilizing, and mulching requirements. The practice is to improve site conditions in order to apply conservation practices or facilitate better use of the landscape.

Feature Measure: Land Area

Scenario Unit: Acres

Scenario Typical Size: 2.0

Scenario Total Cost: $4,358.28

Scenario Cost/Unit: $2,179.14

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 200 HP	928	Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included.	Hours	$190.64	12	$2,287.68
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	12	$267.48
Brush Chipper, 15 in. capacity	1868	Brush Chipper, 15 inch capacity, typically 165 HP. Includes chipper and power unit. Does not include labor.	Hours	$58.31	12	$699.72
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	12	$409.44
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	12	$290.28
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	12	$403.68

Practice: 500 - Obstruction Removal

Scenario: #3 - Removal and Disposal of Fence

Scenario Description:

Remove and disposal of all existing fences by demolition, excavation or other means required for removal. Dispose of all fence materials from the site so that it does not impede subsequent work or cause onsite or offsite damage. Dispose of all materials by removal to an approved landfill, wood chipping and land distribution, or recycling center, burial at an approved location or burning. If burning is used, implement appropriate smoke management to protect public health and safety. Remove and dispose of the unwanted fence obstruction in order to apply conservation practices such as Upland Wildlife Habitat Management (645) or facilitate the planned land use. Fence removal will address the resource concerns of the prevention or hindrance to the installation of conservation practices or present a hazard to their use and enjoyment and reduce hazards to wildlife.

Before Situation:

On any land where existing fence interferes with planned land use development, public safety, wildlife movement and habitat, or infrastructure. The site may be abandoned mine lands, construction sites, recreation areas, farms, ranches, and areas affected by natural disasters. This is not intended for the removal of obstructions from aquatic environments.

After Situation:

The typical fence will be 2640 in linear feet. The removal of the fence will be performed with the use of equipment and hand labor. Dispose of all debris from the fence removal so that it does not impede subsequent work or cause onsite or offsite damage. Revegetate or otherwise protect from erosion disturbed areas as soon as possible. Refer to NRCS Conservation Practice Standard 342, Critical Area Planting for seedbed preparation, seeding, fertilizing, and mulching requirements. The practice is to improve site conditions in order to apply conservation practices or facilitate better use of the landscape such as Upland Wildlife Habitat Management (645).

Feature Measure: Length of Fence

Scenario Unit: Feet

Scenario Typical Size: 2,640.0

Scenario Total Cost: $2,708.91

Scenario Cost/Unit: $1.03

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.72	20	$1,014.40
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	20	$445.80
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	20	$483.80
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	20	$529.20
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 500 - Obstruction Removal

Scenario: #4 - Removal and Disposal of Rock and or Boulders

Scenario Description:

Remove and disposal of rock and or boulders by drilling, blasting, demolition, excavation or other means required for removal. Dispose of all rocks and or boulders so that it does not impede subsequent work or cause onsite or offsite damage. Dispose of all rock and or boulders by removal to an approved location, or reuse location. Remove and dispose all rock and or boulders in order to apply conservation practices or facilitate the planned land use. Rocks and or boulders will address the resource concerns of the prevention or hindrance to the installation of conservation practices or present a hazard to their use and enjoyment.

Before Situation:

On any land where existing obstructions interfere with planned land use development, public safety or infrastructure. The site may be abandoned mine lands, construction sites, recreation areas, farms, ranches, and areas affected by natural disasters. This is not intended for the removal of obstructions from aquatic environments.

After Situation:

The typical area will be a 5.0 acre impaired area. The removal of rock and or boulders will be performed by drilling, blasting, demolition, excavation or other means required for removal with the use of heavy equipment and hand labor. Dispose of all rocks and boulders from the obstruction removal so that it does not impede subsequent work or cause onsite or offsite damage. Revegetate or otherwise protect from erosion disturbed areas as soon as possible. Refer to NRCS Conservation Practice Standard 342, Critical Area Planting for seedbed preparation, seeding, fertilizing, and mulching requirements. The practice is to improve site conditions in order to apply conservation practices or facilitate better use of the landscape.

Feature Measure: Volume

Scenario Unit: Cubic Yards

Scenario Typical Size: 500.0

Scenario Total Cost: $57,542.40

Scenario Cost/Unit: $115.08

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Hydraulic Excavator, .5 CY	930	Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included.	Hours	$57.32	240	$13,756.80
Truck, dump, 18 CY	1400	Dump truck for moving bulk material. Typically capacity is 25 ton or 18 cubic yards. Includes equipment only.	Hours	$90.49	240	$21,717.60
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	240	$8,188.80
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	240	$5,805.60
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	240	$8,073.60

Practice: 500 - Obstruction Removal

Scenario: #5 - Removal and Disposal of Steel and or Concrete Structures

Scenario Description:

Remove and disposal of steel and or concrete structures by demolition, excavation or other means required for removal. Dispose of all steel and or concrete structures so that it does not impede subsequent work or cause onsite or offsite damage. Dispose of all steel and or concrete structures by removal to an approved location, or reuse location. Remove and dispose all steel and or concrete structures in order to apply conservation practices or facilitate the planned land use. Steel and or concrete structure removal will address the resource concerns of the prevention or hindrance to the installation of conservation practices or present a hazard to their use and enjoyment.

Before Situation:

On any land where existing obstructions interfere with planned land use development, public safety or infrastructure. The site may be abandoned mine lands, construction sites, recreation areas, farms, ranches, and areas affected by natural disasters. This is not intended for the removal of obstructions from aquatic environments.

After Situation:

The typical area will be a 2000 square feet of impaired land. The removal of steel and or concrete structures will be performed by demolition, excavation or other means required for removal with the use of heavy equipment and hand labor. Dispose of all steel and or concrete structures from the obstruction removal so that it does not impede subsequent work or cause onsite or offsite damage. Revegetate or otherwise protect from erosion disturbed areas as soon as possible. Refer to NRCS Conservation Practice Standard 342, Critical Area Planting for seedbed preparation, seeding, fertilizing, and mulching requirements. The practice is to improve site conditions in order to apply conservation practices or facilitate better use of the landscape.

Feature Measure: Land Area

Scenario Unit: Square Feet

Scenario Typical Size: 2,000.0

Scenario Total Cost: $27,545.60

Scenario Cost/Unit: $13.77

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 200 HP	928	Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included.	Hours	$190.64	64	$12,200.96
Hydraulic Excavator, .5 CY	930	Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included.	Hours	$57.32	64	$3,668.48
Truck, dump, 18 CY	1400	Dump truck for moving bulk material. Typically capacity is 25 ton or 18 cubic yards. Includes equipment only.	Hours	$90.49	64	$5,791.36
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	64	$2,183.68
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	64	$1,548.16
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	64	$2,152.96

Practice: 500 - Obstruction Removal

Scenario: #6 - Removal and Disposal of Wood Structures

Scenario Description:

Remove and disposal of wood structures by demolition, excavation or other means required for removal. Dispose of all wood structures so that it does not impede subsequent work or cause onsite or offsite damage. Dispose of all wood structures by removal to an approved location, landfill, or reuse location. Remove and dispose all wood structures in order to apply conservation practices or facilitate the planned land use. Wood structure removal will address the resource concerns of the prevention or hindrance to the installation of conservation practices or present a hazard to their use and enjoyment.

Before Situation:

On any land where existing obstructions interfere with planned land use development, public safety or infrastructure. The site may be abandoned mine lands, construction sites, recreation areas, farms, ranches, and areas affected by natural disasters. This is not intended for the removal of obstructions from aquatic environments.

After Situation:

The typical area will be a 2000 square feet of impaired land. The removal of wood structures will be performed by demolition, excavation or other means required for removal with the use of heavy equipment and hand labor. Dispose of all wood structures from the obstruction removal so that it does not impede subsequent work or cause onsite or offsite damage. Revegetate or otherwise protect from erosion disturbed areas as soon as possible. Refer to NRCS Conservation Practice Standard 342, Critical Area Planting for seedbed preparation, seeding, fertilizing, and mulching requirements. The practice is to improve site conditions in order to apply conservation practices or facilitate better use of the landscape.

Feature Measure: Land Area

Scenario Unit: Square Feet

Scenario Typical Size: 2,000.0

Scenario Total Cost: $13,772.80

Scenario Cost/Unit: $6.89

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 200 HP	928	Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included.	Hours	$190.64	32	$6,100.48
Hydraulic Excavator, .5 CY	930	Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included.	Hours	$57.32	32	$1,834.24
Truck, dump, 18 CY	1400	Dump truck for moving bulk material. Typically capacity is 25 ton or 18 cubic yards. Includes equipment only.	Hours	$90.49	32	$2,895.68
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	32	$1,091.84
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	32	$774.08
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	32	$1,076.48

Practice: 511 - Forage Harvest Management

Scenario: #1 - Improved Forage Quality

Scenario Description:
Improved cultural practices and recordkeeping result in better forage quality and better livestock performance.

Before Situation:
Forage cutting heights are as close to the ground as equipment will allow resulting in very low stubble height. Plant regrowth is very slow. Forage quality tests are not regularly done. Records of forage quality components, cutting heights, moisture content, and harvest schedule are not regularly kept.

After Situation:
Forage cutting heights are raised to leave at least 3-4" stubble height for cool season grasses and 6" for warm season grasses. Increased residual forage results in much faster plant regrowth. Forage quality tests are submitted to an accredited lab for analysis. Records of forage quality components, cutting heights, moisture content, and harvest schedule are regularly kept to track increased forage quality and improved livestock performance.

Feature Measure: Improved Relative Feed Value

Scenario Unit: Acres

Scenario Typical Size: 30.0

Scenario Total Cost: $188.85

Scenario Cost/Unit: $6.30

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$109.25	1	$109.25
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	1	$34.12
Materials						
Test, Plant Tissue Test	301	Tissue analysis for crops. Includes materials and shipping only.	Each	$22.74	2	$45.48

Practice: 511 - Forage Harvest Management

Scenario: #2 - Organic Preemptive Harvest

Scenario Description:

Preemptive harvest of forage crops to prevent damage from insects (such as leafhopper on alfalfa) or other pests results in better forage quality and better livestock performance.

Before Situation:

Forage pests are usually controlled with pesticides.

After Situation:

In organic or transitioning to organic systems, forage pests are controlled by executing a preemptive harvest before pests can damage forage quality. Forage yields are reduced because of immature stage of forage growth. Forage tests are submitted to an accredited lab for analysis. Records of forage quality components are used to adjust feeding rations.

Feature Measure: Relative Feed Value Maintained

Scenario Unit: Acres

Scenario Typical Size: 30.0

Scenario Total Cost: $188.85

Scenario Cost/Unit: $6.30

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$109.25	1	$109.25
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	1	$34.12
Materials						
Test, Plant Tissue Test	301	Tissue analysis for crops. Includes materials and shipping only.	Each	$22.74	2	$45.48

Practice: 511 - Forage Harvest Management

Scenario: #3 - Perennial Crops - Delayed Mowing

Scenario Description:

In perennial forage crops, the delaying the harvest of the first cutting to promote the reproduction of ground nesting birds. Delaying the harvest of the first cutting will benefit ground nesting birds; research at the University of Vermont showed that breeding success for declining grassland songbirds (e.g. Bobolink) went from 0 on a regularly harvested hay field to 2.8 fledglings per female per year when the the first harvest on a hayfield was delayed until August 1st. Bobolinks, Eastern Meadowlarks, and Savannah Sparrows require a nesting period to fledge young that lasts through the end of July in most parts of the eastern US. The delayed harvest results in a decrease in overall forage quality. Farmers could see as much as a 50% reduction in market value due to declines in protein (~50%) and digestibility (~20%), making the forage crop less palatable and lower in relative feed value. The selected fields should be large enough to promote ground nesting birds. After young have fledged the field will be harvested for dry forages.

Before Situation:

Perennial forage crops are produced and harvested; ground nesting birds are disturbed and/or fledgling birds are killed in the process.

After Situation:

Annual crops are harvested with a delayed mowing; forage quality is compromised, however, the survival of ground nesting birds is promoted.

Feature Measure: Increased grassland bird populatio

Scenario Unit: Acres

Scenario Typical Size: 30.0

Scenario Total Cost: $1,103.55

Scenario Cost/Unit: $36.79

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$109.25	1	$109.25
Foregone Income						
FI, Hay, General Grass	2122	General Grass Hay is Primary Land Use	Ton	$30.49	30	$914.70
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	1	$34.12
Materials						
Test, Plant Tissue Test	301	Tissue analysis for crops. Includes materials and shipping only.	Each	$22.74	2	$45.48

Practice: 511 - Forage Harvest Management

Scenario: #4 - Double cropping - Delayed harvest and subsequent planting

Scenario Description:

In doublecropped annual forages, delaying the harvest of the first crop will provide feed and shelter for ground nesting birds. Delaying the harvest results in a decrease in overall forage quality. Farmers could see as much as a 50% reduction in market value due to declines in protein (~50%) and digestibility (~20%), making the forage crop less palatable and lower in relative feed value. The selected fields should be large enough to promote ground nesting birds. After the young have fledged the second crop will be planted, approximately one month later than normal. Subsequently, the harvest of the second crop will cause an approximately 20% yield decline. The selected area should be large enough to buffer adults and nestlings from silage chopping in adjacent areas or fields. After young have fledged the field will be chopped and used as grain or silage. This practice is best planned cooperatively with the farmer and appropriate wildlife agencies far enough in advance to reduce disturbance to ground nesting birds. For example, Tricolored Blackbirds need a 35-day window from the time of nest building to fledge young and the silage needs to remain uncut until then.

Before Situation:

Double cropped annual forage crops are produced and harvested; ground nesting birds are disturbed and/or fledgling birds are killed in the process.

After Situation:

Double cropped annual crops are harvested with a delayed mowing and a subesquent later planting of the second crop; forage quality is compromised somewhat, however, the survival of ground nesting birds is promoted.

Feature Measure: Increased grassland bird populatio

Scenario Unit: Acres

Scenario Typical Size: 30.0

Scenario Total Cost: $2,271.93

Scenario Cost/Unit: $75.73

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$109.25	1	$109.25
Foregone Income						
FI, Corn Irrigated	1960	Irrigated Corn is Primary Crop	Acres	$347.18	6	$2,083.08
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	1	$34.12
Materials						
Test, Plant Tissue Test	301	Tissue analysis for crops. Includes materials and shipping only.	Each	$22.74	2	$45.48

Practice: 512 - Pasture and Hay Planting

Scenario: #1 - Native Perennial 1 species

Scenario Description:

Establish or reseed adapted perennial native grasses to improve or maintain livestock/wildlife nutrition and health, extend the length of the grazing season, and provide soil cover to reduce erosion. Used for either conventional or no-till seeding of native grasses for pasture, hayland, and wildlife openings. This practice may be utilized for organic or regular production. This scenario assumes fertilizer, seed, equipment and labor for seed bed prep, tillage, seeding ,and spreading.

Before Situation:

Poorly managed/degraded pasture land or cropland being converted to pasture and/or hay.

After Situation:

Suitable species are established to improve forage quality and quantity and reduce soil erosion on cropland ,hayland, pasture, and/or biomass production.

Feature Measure: Acres of Forgage and Biomass Plant

Scenario Unit: Acres

Scenario Typical Size: 30.0

Scenario Total Cost: $6,542.39

Scenario Cost/Unit: $218.08

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	30	$160.20
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.12	30	$183.60
Lime application	953	Lime application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.57	30	$227.10
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	30	$609.30
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	8	$193.52
Materials						
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.52	1500	$780.00
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.35	1500	$525.00
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$11.76	1	$11.76
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$9.21	30	$276.30
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$111.33	30	$3,339.90
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 512 - Pasture and Hay Planting

Scenario: #2 - Native Perennial 1 species Low Input

Scenario Description:

Establish or reseed adapted perennial native grasses to improve or maintain livestock/wildlife nutrition and health, extend the length of the grazing season, and provide soil cover to reduce erosion. Used for either conventional or no-till seeding of native grasses for pasture, hayland, and wildlife openings. This practice may be utilized for organic or regular production. This scenario assumes fertility and pH are not needed. Seed, equipment and labor for seed bed prep, tillage, seeding ,and spreading are included.

Before Situation:

Poorly managed/degraded pasture land or cropland being converted to pasture and/or hay.

After Situation:

Suitable species are established to improve forage quality and quantity and reduce soil erosion on cropland ,hayland, pasture, and/or biomass production.

Feature Measure: Acres of Forgage and Biomass Plant

Scenario Unit: Acres

Scenario Typical Size: 30.0

Scenario Total Cost: $4,826.69

Scenario Cost/Unit: $160.89

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	30	$160.20
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	30	$609.30
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	8	$193.52
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$11.76	1	$11.76
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$9.21	30	$276.30
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$111.33	30	$3,339.90
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 512 - Pasture and Hay Planting

Scenario: #3 - Native Perennial 2 or more species

Scenario Description:

Establish or reseed with 2 or more adapted perennial native warm season grasses to improve or maintain livestock/wildlife nutrition and health, extend the length of the grazing season, and provide soil cover to reduce erosion. Used for either conventional or no-till seeding of perennial native warm season grasses for pasture, hayland, and wildlife openings. This practice may be utilized for organic or regular production. This scenario assumes fertilizer, seed, equipment and labor for seed bed prep, tillage, seeding ,and spreading.

Before Situation:

Existing stand of perennial grasses or monoculture or no grasses present. Resource concerns may include undesireable plant productivity and health, inadequate feed and forage for livestock, soil erosion and soil quality.

After Situation:

Suitable NWSG species are established to improve forage quality and quantity and reduce soil erosion on cropland, hayland, pasture and/or biomass production.

Feature Measure: Acres of Forgage and Biomass Plant

Scenario Unit: Acres

Scenario Typical Size: 30.0

Scenario Total Cost: $6,655.49

Scenario Cost/Unit: $221.85

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	30	$296.70
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	30	$160.20
Lime application	953	Lime application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.57	30	$227.10
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	30	$609.30
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	8	$193.52
Materials						
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.52	1500	$780.00
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.35	1500	$525.00
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$11.76	1	$11.76
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$9.21	30	$276.30
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$111.33	30	$3,339.90
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 512 - Pasture and Hay Planting

Scenario: #4 - Native Perennial 2 or more species with Low Input

Scenario Description:

Establish or reseed with two or more adapted perennial native warm season grasses to improve or maintain livestock/wildlife nutrition and health, extend the length of the grazing season, and provide soil cover to reduce erosion. Used for either conventional or no-till seeding of perennial native warm season grasses for pasture, hayland, and wildlife openings. This practice may be utilized for organic or regular production. This scenario assumes fertility and pH are not needed. Seed, equipment and labor for seed bed prep, tillage, seeding ,and spreading are included.

Before Situation:

Existing stand of perennial grasses or monoculture or no grasses present. Resource concerns may include undesireable plant productivity and health, inadequate feed and forage for livestock, soil erosion and soil quality.

After Situation:

Suitable NWSG species are established to improve forage quality and quantity and reduce soil erosion on cropland, hayland, pasture and/or biomass production.

Feature Measure: Acres of Forgage and Biomass Plant

Scenario Unit: Acres

Scenario Typical Size: 30.0

Scenario Total Cost: $5,123.39

Scenario Cost/Unit: $170.78

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	30	$296.70
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	30	$160.20
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	30	$609.30
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	8	$193.52
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$11.76	1	$11.76
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$9.21	30	$276.30
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$111.33	30	$3,339.90
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 512 - Pasture and Hay Planting

Scenario: #5 - Introduced Cool Season Grasses with Legumes

Scenario Description:

Establish or reseed adapted perennial introduced cool season grasses and legumes to improve or maintain livestock/wildlife nutrition and health, extend the length of the grazing season, and provide soil cover to reduce erosion. Used for either conventional or no-till seeding of perennial introduced cool season grasses for pasture, hayland, and wildlife openings. This practice may be utilized for organic or regular production. This scenario assumes fertilizer, seed, equipment and labor for seed bed prep, tillage, seeding ,and spreading.

Before Situation:

Poor or nonexistent stand of grass species. Resource concerns may include undesireable plant productivity and health, inadequate feed and forage for livestock, soil erosion and soil quality.

After Situation:

Suitable species are established to improve forage quality and quantity and reduce soil erosion on cropland ,hayland, pasture, and/or biomass production.

Feature Measure: Acres of Forgage and Biomass Plant

Scenario Unit: Acres

Scenario Typical Size: 30.0

Scenario Total Cost: $4,890.59

Scenario Cost/Unit: $163.02

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	30	$296.70
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	30	$160.20
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.12	30	$183.60
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	30	$609.30
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	8	$193.52
Materials						
Nitrogen (N), Ammonium Nitrate	69	Price per pound of N supplied by Ammonium Nitrate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.58	1200	$696.00
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.52	1500	$780.00
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.35	1500	$525.00
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$11.76	1	$11.76
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$9.21	30	$276.30
Introduced Perennial Grasses, Legumes and/or Forbs, Low Density	2747	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$30.75	30	$922.50
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 512 - Pasture and Hay Planting

Scenario: #6 - Introduced Cool Season Grasses with Legumes with Low Input

Scenario Description:

Establish or reseed adapted perennial introduced cool season grasses and legumes to improve or maintain livestock/wildlife nutrition and health, extend the length of the grazing season, and provide soil cover to reduce erosion. Used for either conventional or no-till seeding of perennial introduced cool season grasses for pasture, hayland, and wildlife openings. This practice may be utilized for organic or regular production. This scenario assumes fertility and pH are not needed. Seed, equipment and labor for seed bed prep, tillage, seeding ,and spreading are included.

Before Situation:

Poor or nonexistent stand of grass species. Resource concerns may include undesireable plant productivity and health, inadequate feed and forage for livestock, soil erosion and soil quality.

After Situation:

Suitable species are established to improve forage quality and quantity and reduce soil erosion on cropland ,hayland, pasture, and/or biomass production.

Feature Measure: Acres of Forgage and Biomass Plant

Scenario Unit: Acres

Scenario Typical Size: 30.0

Scenario Total Cost: $2,705.99

Scenario Cost/Unit: $90.20

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	30	$296.70
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	30	$160.20
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	30	$609.30
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	8	$193.52
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$11.76	1	$11.76
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$9.21	30	$276.30
Introduced Perennial Grasses, Legumes and/or Forbs, Low Density	2747	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$30.75	30	$922.50
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 512 - Pasture and Hay Planting

Scenario: #7 - Introduced Warm Season Grasses

Scenario Description:

Establish or reseed adapted introduced warm season grasses to improve or maintain livestock/wildlife nutrition and health, extend the length of the grazing season, and provide soil cover to reduce erosion. Used for either conventional or no-till seeding of perennial introduced warm season grasses for pasture, hayland, and wildlife openings. This practice may be utilized for organic or regular production. This scenario assumes fertilizer, seed, equipment and labor for seed bed prep, tillage, seeding ,and spreading.

Before Situation:

Existing stand of perennial grasses or monoculture or no grasses present. Resource concerns may include undesireable plant productivity and health, inadequate feed and forage for livestock, soil erosion and soil quality.

After Situation:

Suitable species are established to improve forage quality and quantity and reduce soil erosionon cropland ,hayland, pasture, and/or biomass production.

Feature Measure: Acres of Forgage and Biomass Plant

Scenario Unit: Acres

Scenario Typical Size: 30.0

Scenario Total Cost: $4,890.59

Scenario Cost/Unit: $163.02

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	30	$296.70
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	30	$160.20
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.12	30	$183.60
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	30	$609.30
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	8	$193.52
Materials						
Nitrogen (N), Ammonium Nitrate	69	Price per pound of N supplied by Ammonium Nitrate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.58	1200	$696.00
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.52	1500	$780.00
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.35	1500	$525.00
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$11.76	1	$11.76
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$9.21	30	$276.30
Introduced Perennial Grasses, Legumes and/or Forbs, Low Density	2747	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$30.75	30	$922.50
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 512 - Pasture and Hay Planting

Scenario: #8 - Introduced Warm Season Grasses with Low Input

Scenario Description:

Establish or reseed adapted introduced warm season grasses to improve or maintain livestock/wildlife nutrition and health, extend the length of the grazing season, and provide soil cover to reduce erosion. Used for either conventional or no-till seeding of perennial introduced warm season grasses for pasture, hayland, and wildlife openings. This practice may be utilized for organic or regular production. This scenario assumes fertility and pH are not needed. Seed, equipment and labor for seed bed prep, tillage, seeding ,and spreading are included.

Before Situation:

Existing stand of perennial grasses or monoculture or no grasses present. Resource concerns may include undesireable plant productivity and health, inadequate feed and forage for livestock, soil erosion and soil quality.

After Situation:

Suitable species are established to improve forage quality and quantity and reduce soil erosionon cropland ,hayland, pasture, and/or biomass production.

Feature Measure: Acres of Forgage and Biomass Plant

Scenario Unit: Acres

Scenario Typical Size: 30.0

Scenario Total Cost: $2,705.99

Scenario Cost/Unit: $90.20

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	30	$296.70
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	30	$160.20
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	30	$609.30
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	8	$193.52
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$11.76	1	$11.76
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$9.21	30	$276.30
Introduced Perennial Grasses, Legumes and/or Forbs, Low Density	2747	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$30.75	30	$922.50
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 512 - Pasture and Hay Planting

Scenario: #9 - Grass Establishment-Sprigging

Scenario Description:

Sprigging new grasses with sprigging application for the purpose of providing forage, increasing plant diversity, soil quality and fertility, and plant health. This practice may be utilized for organic or regular production. This scenario assumes fertilizer, sprigs, equipment and labor for seed bed prep, tillage, sprigging ,and spreading.

Before Situation:

Poor or nonexistent stand of grass species. Resource concerns may include undesireable plant productivity and health, inadequate feed and forage for livestock, soil erosion and soil quality.

After Situation:

Suitable species are established to improve forage quality and quantity and reduce soil erosion on cropland ,hayland, pasture, and/or biomass production.

Feature Measure: Acres of Forgage and Biomass Plant

Scenario Unit: Acres

Scenario Typical Size: 30.0

Scenario Total Cost: $8,194.28

Scenario Cost/Unit: $273.14

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	30	$296.70
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	30	$160.20
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.12	30	$183.60
Ground sprigging	1101	Includes costs for equipment, power unit and labor.	Acres	$57.71	30	$1,731.30
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	8	$193.52
Materials						
Nitrogen (N), Ammonium Nitrate	69	Price per pound of N supplied by Ammonium Nitrate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.58	1200	$696.00
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.52	1500	$780.00
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.35	1500	$525.00
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$11.76	1	$11.76
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$9.21	30	$276.30
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$111.33	30	$3,339.90

Practice: 512 - Pasture and Hay Planting

Scenario: #10 - Overseeding Legumes

Scenario Description:

Establishment of legumes for the purpose of increasing plant diversity, soil quality and fertility, and plant health and enhancing the quality of forage. This practice may be utilized for organic or regular production. This scenario assumes fertilizer, seed, equipment and labor for seed bed prep, seeding, and spreading. Mowing to be used to reduce light competition for overseeded legumes during germination.

Before Situation:

Existing stand of perennial grasses or monoculture with no legumes present .

After Situation:

Legumes will be maintained through proper grazing management and improve plant diversity and soil quality.

Feature Measure: Acres of Forgage and Biomass Plant

Scenario Unit: Acres

Scenario Typical Size: 30.0

Scenario Total Cost: $7,447.19

Scenario Cost/Unit: $248.24

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hours	$46.50	10	$465.00
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.12	30	$183.60
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	30	$609.30
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	8	$193.52
Materials						
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.52	1500	$780.00
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.35	1500	$525.00
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$50.08	60	$3,004.80
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$11.76	1	$11.76
Annual Grasses, Legumes or Forbs	2732	A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$47.95	30	$1,438.50
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 512 - Pasture and Hay Planting

Scenario: #56 - Native perennial, Conversion from Irrigated cropland, w/FI

Scenario Description:

Establish a new pasture with 2 or more adapted perennial native warm season grasses on land converted from cropland to provide soil cover to reduce erosion, reduce impacts to groundwater aquifers and provide habitat for wildlife. Used for either conventional or no-till seeding of perennial native warm season grasses for pasture, hayland, and wildlife openings. This practice may be utilized for organic or regular production. This scenario includes foregone income when IRRIGATED crops are no longer produced. It assumes fertilizer, seed, equipment and labor for seed bed prep, tillage, seeding ,and spreading.

Before Situation:

Existing monoculture cropland. Resource concerns may include inadequate habitat for fish and wildlife, soil erosion, and soil quality degradation.

After Situation:

A diversified stand of predominantly native grasses is established to protect soil from erosion, increase carbon sequestration, improve soil health, provide habitat for pollinators and other wildlife, and provide adequate forage for livestock.

Feature Measure: Acres of Forage and Biomass Planti

Scenario Unit: Acres

Scenario Typical Size: 30.0

Scenario Total Cost: $16,832.03

Scenario Cost/Unit: $561.07

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	30	$296.70
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	30	$160.20
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	30	$609.30
Foregone Income						
FI, Corn Irrigated	1960	Irrigated Corn is Primary Crop	Acres	$347.18	30	$10,415.40
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	8	$193.52
Materials						
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.52	1500	$780.00
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.35	1500	$525.00
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$9.21	30	$276.30
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$111.33	30	$3,339.90
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 512 - Pasture and Hay Planting

Scenario: #57 - Conversion from Irrigated cropland, lower value crops, w/FI

Scenario Description:

Establish a new pasture with 2 or more adapted perennial native warm season grasses on land converted from cropland to provide soil cover to reduce erosion, reduce impacts to groundwater aquifers and provide habitat for wildlife. Used for either conventional or no-till seeding of perennial native warm season grasses for pasture, hayland, and wildlife openings. This practice may be utilized for organic or regular production. This scenario includes foregone income when irrigated crops of LOWER VALUE are no longer produced. It assumes fertilizer, seed, equipment and labor for seed bed prep, tillage, seeding ,and spreading.

Before Situation:

A monoculture of lower value crops, such as wheat, are grown on cropland. The resource concerns include soil erosion, soil quality degradation, inadequate habitat for fish and wildlife.

After Situation:

A diversified stand of predominantly native grasses is established to protect soil from erosion, increase carbon sequestration and improve soil health, provide habitat for pollinators and other wildlife, and provide adequate forage for livestock.

Feature Measure: Acres of Forage and Biomass Planti

Scenario Unit: Acres

Scenario Typical Size: 30.0

Scenario Total Cost: $12,873.53

Scenario Cost/Unit: $429.12

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	30	$296.70
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	30	$160.20
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	30	$609.30
Foregone Income						
FI, Wheat Irrigated	1964	Irrigated Wheat is Primary Crop	Acres	$215.23	30	$6,456.90
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	8	$193.52
Materials						
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.52	1500	$780.00
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.35	1500	$525.00
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$9.21	30	$276.30
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$111.33	30	$3,339.90
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 516 - Livestock Pipeline

Scenario: #1 - PVC (Iron Pipe Size)

Scenario Description:

Description: Below ground installation of PVC (Iron Pipe Size) pipeline. PVC (IPS) is manufactured in sizes (nominal diameter) from ½-inch to 36-inch; typical practice sizes range from 1-inch to 4-inch; and typical scenario size is 1½-inch. Construct one mile (5,280 feet) of 1½-inch, Schedule 40, PVC Pipeline with appurtenances, installed below ground with a minimum 1.5 feet of ground cover. The scenario unit is weight of pipe material in pounds. 5,280 feet of 1½-inch, Schedule 40, PVC pipe weighs 0.501 lb/ft, or a total of 2,645 pounds. Appurtenances include: couplings, fittings, thrust blocks, gate valves (2), air release valves (2), drain valve (1), and pressure relief valve (1), and are included in the cost of pipe material (additional 10% of pipe material quantity). Revegetation is not included. Resource Concerns: Inadequate Livestock Water, Inefficient Energy Use. Associated Practices: Critical Area Planting (342), Pumping Plant (533), Watering Facility (614), and Water Harvesting Catchment (636).

Before Situation:

Water supplies need to be conveyed through pipelines for use by livestock or wildlife.

After Situation:

Pipeline(s) convey and/or distribute water to storage and/or watering facilities, for use by livestock or wildlife.

Feature Measure: Weight of Pipe

Scenario Unit: Pound

Scenario Typical Size: 2,645.0

Scenario Total Cost: $14,901.84

Scenario Cost/Unit: $5.63

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Trenching, Earth, 12 in. x 48 in.	53	Trenching, earth, 12 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling	Feet	$1.24	5280	$6,547.20
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	48	$1,161.12
Materials						
Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.31	2910	$6,722.10
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 516 - Livestock Pipeline

Scenario: #2 - PVC (Iron Pipe Size) < 3 inch Boring

Scenario Description:

Description: Below ground installation of PVC (Iron Pipe Size) pipeline. PVC (IPS) is manufactured in sizes (nominal diameter) from ½-inch to 36-inch; typical practice sizes range from 1-inch to 4-inch; and typical scenario size is 1½-inch. Construct one mile (5,280 feet) of 1½-inch, Schedule 40, PVC Pipeline with appurtenances, installed below ground with a minimum 1.5 feet of ground cover. The scenario unit is weight of pipe material in pounds. 5,280 feet of 1½-inch, Schedule 40, PVC pipe weighs 0.501 lb/ft, or a total of 2,645 pounds. Appurtenances include: couplings, fittings, thrust blocks, gate valves (2), air release valves (2), drain valve (1), and pressure relief valve (1), and are included in the cost of pipe material (additional 10% of pipe material quantity). Revegetation is not included. Resource Concerns: Inadequate Livestock Water, Inefficient Energy Use. Associated Practices: Critical Area Planting (342), Pumping Plant (533), Watering Facility (614), and Water Harvesting Catchment (636).

Before Situation:

Water supplies need to be conveyed through pipelines for use by livestock or wildlife.

After Situation:

Pipeline(s) convey and/or distribute water to storage and/or watering facilities, for use by livestock or wildlife.

Feature Measure: Weight of Pipe

Scenario Unit: Pound

Scenario Typical Size: 2,645.0

Scenario Total Cost: $18,115.84

Scenario Cost/Unit: $6.85

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Trenching, Earth, 12 in. x 48 in.	53	Trenching, earth, 12 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling	Feet	$1.24	5280	$6,547.20
Horizontal Boring, Less Than Equal 3 in. diameter	1131	Includes equipment, labor and setup.	Feet	$64.28	50	$3,214.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	48	$1,161.12
Materials						
Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.31	2910	$6,722.10
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 516 - Livestock Pipeline

Scenario: #3 - PVC (Iron Pipe Size) > 3 inch Boring

Scenario Description:

Description: Below ground installation of PVC (Iron Pipe Size) pipeline. PVC (IPS) is manufactured in sizes (nominal diameter) from ½-inch to 36-inch; typical practice sizes range from 1-inch to 4-inch; and typical scenario size is 1½-inch. Construct one mile (5,280 feet) of 1½-inch, Schedule 40, PVC Pipeline with appurtenances, installed below ground with a minimum 1.5 feet of ground cover. The scenario unit is weight of pipe material in pounds. 5,280 feet of 1½-inch, Schedule 40, PVC pipe weighs 0.501 lb/ft, or a total of 2,645 pounds. Appurtenances include: couplings, fittings, thrust blocks, gate valves (2), air release valves (2), drain valve (1), and pressure relief valve (1), and are included in the cost of pipe material (additional 10% of pipe material quantity). Revegetation is not included. Resource Concerns: Inadequate Livestock Water, Inefficient Energy Use. Associated Practices: Critical Area Planting (342), Pumping Plant (533), Watering Facility (614), and Water Harvesting Catchment (636).

Before Situation:

Water supplies need to be conveyed through pipelines for use by livestock or wildlife.

After Situation:

Pipeline(s) convey and/or distribute water to storage and/or watering facilities, for use by livestock or wildlife.

Feature Measure: Weight of Pipe

Scenario Unit: Pound

Scenario Typical Size: 2,645.0

Scenario Total Cost: $19,910.84

Scenario Cost/Unit: $7.53

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Trenching, Earth, 12 in. x 48 in.	53	Trenching, earth, 12 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling	Feet	$1.24	5280	$6,547.20
Horizontal Boring, Greater Than 3 in. diameter	1132	Includes equipment, labor and setup.	Feet	$100.18	50	$5,009.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	48	$1,161.12
Materials						
Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.31	2910	$6,722.10
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 516 - Livestock Pipeline

Scenario: #4 - HDPE (Iron Pipe Size & Tubing)

Scenario Description:

Description: Below ground installation of HDPE (Iron Pipe Size & Tubing) pipeline. HDPE (IPS &Tubing) is manufactured in sizes (nominal diameter) from ½-inch to 24-inch; typical practice sizes range from 1-inch to 4-inch; and typical scenario size is 1½-inch. Construct one mile (5,280 feet) of 1½-inch, Class 200 (SDR-9.0, PE4708), HDPE Pipeline with appurtenances, installed below ground with a minimum 1.5 feet of ground cover. Typical size range of pipe installed: 1-inch to 4-inch. The scenario unit is weight of pipe material in pounds. 5,280 feet of 1½-inch, Class 200 (SDR-9.0, PE4708), HDPE pipe weighs 0.475 lb/ft, or a total of 2,508 pounds. Appurtenances include: fittings, anchors, thrust blocks, gate valves (2), air release valves (2), drain valve (1), and pressure relief valve (1), and are included in the cost of pipe material (additional 10% of pipe material quantity). Revegetation is not included. Resource Concerns: Inadequate Livestock Water, Inefficient Energy Use. Associated Practices: Critical Area Planting (342), Pumping Plant (533), Watering Facility (614), and Water Harvesting Catchment (636).

Before Situation:

Water supplies need to be conveyed through pipelines for use by livestock or wildlife.

After Situation:

Pipeline(s) convey and/or distribute water to storage and/or watering facilities, for use by livestock or wildlife.

Feature Measure: Weight of Pipe

Scenario Unit: Pound

Scenario Typical Size: 2,508.0

Scenario Total Cost: $15,089.23

Scenario Cost/Unit: $6.02

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Trenching, Pipeline Plowing	1096	Includes equipment and labor for plowing small diameter lines in common earth (< 3")	Feet	$0.99	5280	$5,227.20
Fuser for HDPE Pipe	1383	Fusing machine for 1 to 12 inch diameter HDPE pipe joints. Equipment costs only. Does not include labor.	Hours	$18.30	8	$146.40
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	32	$774.08
Materials						
Pipe, HDPE, smooth wall, weight priced	1379	High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only.	Pound	$3.07	2759	$8,470.13
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 516 - Livestock Pipeline

Scenario: #5 - HDPE (Iron Pipe Size & Tubing) < 3 inch Boring

Scenario Description:

Description: Below ground installation of HDPE (Iron Pipe Size & Tubing) pipeline. HDPE (IPS &Tubing) is manufactured in sizes (nominal diameter) from ½-inch to 24-inch; typical practice sizes range from 1-inch to 4-inch; and typical scenario size is 1½-inch. Construct one mile (5,280 feet) of 1½-inch, Class 200 (SDR-9.0, PE4708), HDPE Pipeline with appurtenances, installed below ground with a minimum 1.5 feet of ground cover. Typical size range of pipe installed: 1-inch to 4-inch. The scenario unit is weight of pipe material in pounds. 5,280 feet of 1½-inch, Class 200 (SDR-9.0, PE4708), HDPE pipe weighs 0.475 lb/ft, or a total of 2,508 pounds. Appurtenances include: fittings, anchors, thrust blocks, gate valves (2), air release valves (2), drain valve (1), and pressure relief valve (1), and are included in the cost of pipe material (additional 10% of pipe material quantity). Revegetation is not included. Resource Concerns: Inadequate Livestock Water, Inefficient Energy Use. Associated Practices: Critical Area Planting (342), Pumping Plant (533), Watering Facility (614), and Water Harvesting Catchment (636).

Before Situation:

Water supplies need to be conveyed through pipelines for use by livestock or wildlife.

After Situation:

Pipeline(s) convey and/or distribute water to storage and/or watering facilities, for use by livestock or wildlife.

Feature Measure: Weight of Pipe

Scenario Unit: Pound

Scenario Typical Size: 2,508.0

Scenario Total Cost: $18,303.23

Scenario Cost/Unit: $7.30

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Trenching, Pipeline Plowing	1096	Includes equipment and labor for plowing small diameter lines in common earth (< 3")	Feet	$0.99	5280	$5,227.20
Horizontal Boring, Less Than Equal 3 in. diameter	1131	Includes equipment, labor and setup.	Feet	$64.28	50	$3,214.00
Fuser for HDPE Pipe	1383	Fusing machine for 1 to 12 inch diameter HDPE pipe joints. Equipment costs only. Does not include labor.	Hours	$18.30	8	$146.40
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	32	$774.08
Materials						
Pipe, HDPE, smooth wall, weight priced	1379	High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only.	Pound	$3.07	2759	$8,470.13
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 516 - Livestock Pipeline

Scenario: #6 - HDPE (Iron Pipe Size & Tubing) >3 inch Boring

Scenario Description:

Description: Below ground installation of HDPE (Iron Pipe Size & Tubing) pipeline. HDPE (IPS &Tubing) is manufactured in sizes (nominal diameter) from ½-inch to 24-inch; typical practice sizes range from 1-inch to 4-inch; and typical scenario size is 1½-inch. Construct one mile (5,280 feet) of 1½-inch, Class 200 (SDR-9.0, PE4708), HDPE Pipeline with appurtenances, installed below ground with a minimum 1.5 feet of ground cover. Typical size range of pipe installed: 1-inch to 4-inch. The scenario unit is weight of pipe material in pounds. 5,280 feet of 1½-inch, Class 200 (SDR-9.0, PE4708), HDPE pipe weighs 0.475 lb/ft, or a total of 2,508 pounds. Appurtenances include: fittings, anchors, thrust blocks, gate valves (2), air release valves (2), drain valve (1), and pressure relief valve (1), and are included in the cost of pipe material (additional 10% of pipe material quantity). Revegetation is not included. Resource Concerns: Inadequate Livestock Water, Inefficient Energy Use. Associated Practices: Critical Area Planting (342), Pumping Plant (533), Watering Facility (614), and Water Harvesting Catchment (636).

Before Situation:

Water supplies need to be conveyed through pipelines for use by livestock or wildlife.

After Situation:

Pipeline(s) convey and/or distribute water to storage and/or watering facilities, for use by livestock or wildlife.

Feature Measure: Weight of Pipe

Scenario Unit: Pound

Scenario Typical Size: 2,508.0

Scenario Total Cost: $20,098.23

Scenario Cost/Unit: $8.01

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Trenching, Pipeline Plowing	1096	Includes equipment and labor for plowing small diameter lines in common earth (< 3")	Feet	$0.99	5280	$5,227.20
Horizontal Boring, Greater Than 3 in. diameter	1132	Includes equipment, labor and setup.	Feet	$100.18	50	$5,009.00
Fuser for HDPE Pipe	1383	Fusing machine for 1 to 12 inch diameter HDPE pipe joints. Equipment costs only. Does not include labor.	Hours	$18.30	8	$146.40
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	32	$774.08
Materials						
Pipe, HDPE, smooth wall, weight priced	1379	High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only.	Pound	$3.07	2759	$8,470.13
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 516 - Livestock Pipeline

Scenario: #7 - Surface HDPE (Iron Pipe Size & Tubing)

Scenario Description:

Description: on-ground surface installation of HDPE (Iron Pipe Size & Tubing) pipeline. HDPE (IPS & Tubing) is manufactured in sizes (nominal diameter) from ½-inch to 24-inch; typical practice sizes range from 1-inch to 4-inch; and typical scenario size is 1½-inch. Construct one mile (5,280 feet) of 1½-inch, Class 200 (SDR-9.0, PE4708), HDPE Pipeline with appurtenances, installed on the ground surface. Typical size range of pipe installed: 1-inch to 4-inch. The scenario unit is weight of pipe material in pounds. 5,280 feet of 1½-inch, Class 200 (SDR-9.0, PE4708), HDPE pipe weighs 0.475 lb/ft, or a total of 2,508 pounds. Appurtenances include: couplings, fittings, anchors, thrust blocks, gate valves (2), air release valves (2), drain valve (1), and pressure relief valve (1), and are included in the cost of pipe material (additional 15% of pipe material quantity). Revegetation is not included. Resource Concerns: Inadequate Livestock Water, Inefficient Energy Use. Associated Practices: Critical Area Planting (342), Pumping Plant (533), Watering Facility (614), and Water Harvesting Catchment (636).

Before Situation:

Water supplies need to be conveyed through pipelines for use by livestock or wildlife.

After Situation:

Pipeline(s) convey and/or distribute water to storage and/or watering facilities, for use by livestock or wildlife.

Feature Measure: Weight of Pipe

Scenario Unit: Pound

Scenario Typical Size: 2,508.0

Scenario Total Cost: $9,904.54

Scenario Cost/Unit: $3.95

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Fuser for HDPE Pipe	1383	Fusing machine for 1 to 12 inch diameter HDPE pipe joints. Equipment costs only. Does not include labor.	Hours	$18.30	8	$146.40
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	32	$774.08
Materials						
Pipe, HDPE, smooth wall, weight priced	1379	High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only.	Pound	$3.07	2884	$8,853.88
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	2	$130.18

Practice: 516 - Livestock Pipeline

Scenario: #8 - Steel (Iron Pipe Size)

Scenario Description:

Description: Below ground installation of Steel (Iron Pipe Size) pipeline. Steel (IPS) is manufactured in sizes (nominal diameter) from ½-inch to 36-inch; typical practice sizes range from 1-inch to 4-inch; and typical scenario size is 1½-inch. Construct one mile (5,280 feet) of 1½-inch, Schedule 40, Galvanized Steel Pipeline with appurtenances, installed below ground with a minimum 1.5 feet of ground cover. Typical size range of pipe installed: 1-inch to 4-inch. The scenario unit is weight of pipe material in pounds. 5,280 feet of 1½-inch, Schedule 40, Galvanized Steel Pipe weighs 2.718 lb/ft, or a total of 14,351 pounds. Appurtenances include: couplings, fittings, thrust blocks, gate valves (2), air release valves (2), drain valve (1), and pressure relief valve (1), and are included in the cost of pipe material (additional 10% of pipe material quantity). Revegetation is not included. Resource Concerns: Inadequate Livestock Water, Inefficient Energy Use. Associated Practices: Critical Area Planting (342), Pumping Plant (533), Watering Facility (614), and Water Harvesting Catchment (636).

Before Situation:

Water supplies need to be conveyed through pipelines for use by livestock or wildlife.

After Situation:

Pipeline(s) convey and/or distribute water to storage and/or watering facilities, for use by livestock or wildlife.

Feature Measure: Weight of Pipe

Scenario Unit: Pound

Scenario Typical Size: 14,351.0

Scenario Total Cost: $40,811.10

Scenario Cost/Unit: $2.84

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Trenching, Earth, 12 in. x 48 in.	53	Trenching, earth, 12 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling	Feet	$1.24	5280	$6,547.20
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	144	$3,483.36
Materials						
Pipe, steel, smooth wall, galvanized, weight priced	1381	Steel manufactured into galvanized smooth wall pipe	Pound	$1.92	15786	$30,309.12
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 516 - Livestock Pipeline

Scenario: #9 - Surface Steel (Iron Pipe Size)

Scenario Description:

Description: on-ground surface installation of Steel (Iron Pipe Size) pipeline. Steel (IPS) is manufactured in sizes (nominal diameter) from ½-inch to 36-inch; typical practice sizes range from 1-inch to 4-inch; and typical scenario size is 1½-inch. Construct one mile (5,280 feet) of 1½-inch, Schedule 40, Galvanized Steel Pipeline with appurtenances, installed on the ground surface. Typical size range of pipe installed: 1-inch to 4-inch. The scenario unit is weight of pipe material in pounds. 5,280 feet of 1½-inch, Schedule 40, Galvanized Steel Pipe weighs 2.718 lb/ft, or a total of 14,351 pounds. Appurtenances include: couplings, fittings, expansion joints, anchors, thrust blocks, gate valves (2), air release valves (2), drain valve (1), and pressure relief valve (1), and are included in the cost of pipe material (additional 15% of pipe material quantity). Revegetation is not included. Resource Concerns: Inadequate Livestock Water, Inefficient Energy Use. Associated Practices: Critical Area Planting (342), Pumping Plant (533), Watering Facility (614), and Water Harvesting Catchment (636).

Before Situation:

Water supplies need to be conveyed through pipelines for use by livestock or wildlife.

After Situation:

Pipeline(s) convey and/or distribute water to storage and/or watering facilities, for use by livestock or wildlife.

Feature Measure: Weight of Pipe

Scenario Unit: Pound

Scenario Typical Size: 14,351.0

Scenario Total Cost: $35,171.04

Scenario Cost/Unit: $2.45

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	144	$3,483.36
Materials						
Pipe, steel, smooth wall, galvanized, weight priced	1381	Steel manufactured into galvanized smooth wall pipe	Pound	$1.92	16504	$31,687.68

Practice: 516 - Livestock Pipeline

Scenario: #10 - HDPE (Iron Pipe Size & Tubing) - Remote locations

Scenario Description:

Description: Below ground installation of HDPE (Iron Pipe Size & Tubing) pipeline. HDPE (IPS &Tubing) is manufactured in sizes (nominal diameter) from ½-inch to 24-inch; typical practice sizes range from 1-inch to 4-inch; and typical scenario size is 1½-inch. Construct one mile (5,280 feet) of 1½-inch, Class 200 (SDR-9.0, PE4708), HDPE Pipeline with appurtenances, installed below ground with a minimum 1.5 feet of ground cover. Typical size range of pipe installed: 1-inch to 4-inch. The scenario unit is weight of pipe material in pounds. 5,280 feet of 1½-inch, Class 200 (SDR-9.0, PE4708), HDPE pipe weighs 0.475 lb/ft, or a total of 2,508 pounds. Appurtenances include: fittings, anchors, thrust blocks, gate valves (2), air release valves (2), drain valve (1), and pressure relief valve (1), and are included in the cost of pipe material (additional 10% of pipe material quantity). Revegetation is not included. Scenario specifically applies to remote locations that are 50 or miles from source of equipment and/or materials. Resource Concerns: Inadequate Livestock Water, Inefficient Energy Use. Associated Practices: Critical Area Planting (342), Pumping Plant (533), Watering Facility (614), and Water Harvesting Catchment (636).

Before Situation:

Water supplies need to be conveyed through pipelines for use by livestock or wildlife.

After Situation:

Pipeline(s) convey and/or distribute water to storage and/or watering facilities, for use by livestock or wildlife.

Feature Measure: Weight of Pipe

Scenario Unit: Pound

Scenario Typical Size: 2,508.0

Scenario Total Cost: $15,689.23

Scenario Cost/Unit: $6.26

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Trenching, Pipeline Plowing	1096	Includes equipment and labor for plowing small diameter lines in common earth (< 3")	Feet	$0.99	5280	$5,227.20
Fuser for HDPE Pipe	1383	Fusing machine for 1 to 12 inch diameter HDPE pipe joints. Equipment costs only. Does not include labor.	Hours	$18.30	8	$146.40
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	32	$774.08
Materials						
Pipe, HDPE, smooth wall, weight priced	1379	High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only.	Pound	$3.07	2759	$8,470.13
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	600	$600.00
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 516 - Livestock Pipeline

Scenario: #11 - 1.25 inch 160 psi PVC-SDR per foot

Scenario Description:

Description: Below ground installation of PVC-SDR pipeline. PVC is manufactured in sizes (nominal diameter) from ½-inch to 36-inch; typical practice sizes range from 1-inch to 4-inch; and this scenario size is 1-1/4-inch 160 psi PVC. Construct one mile (5,280 feet) of 1-1/4-inch 160 psi PVC pipeline with appurtenances, installed below ground with a minimum 1.5 feet of ground cover. The scenario unit is feet. Appurtenances include: couplings, fittings, thrust blocks, gate valves (2), air release valves (2), drain valve (1), and pressure relief valve (1), and are included in the cost of pipe material (additional 10% of pipe material quantity). Revegetation is not included. Resource Concerns: Inadequate Livestock Water, Inefficient Energy Use. Associated Practices: Critical Area Planting (342), Pumping Plant (533), Watering Facility (614), and Water Harvesting Catchment (636).

Before Situation:

Water supplies need to be conveyed through pipelines for use by livestock or wildlife.

After Situation:

Pipeline(s) convey and/or distribute water to storage and/or watering facilities, for use by livestock or wildlife.

Feature Measure: Length of Pipeline Installed

Scenario Unit: Feet

Scenario Typical Size: 5,280.0

Scenario Total Cost: $11,131.92

Scenario Cost/Unit: $2.11

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Trenching, Earth, 12 in. x 48 in.	53	Trenching, earth, 12 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling	Feet	$1.24	5280	$6,547.20
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	48	$1,161.12
Materials						
Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.31	1278	$2,952.18
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 516 - Livestock Pipeline

Scenario: #12 - 1.5 inch HDPE per foot

Scenario Description:

Below ground installation of HDPE (Iron Pipe Size & Tubing) pipeline. HDPE (IPS &Tubing) is manufactured in sizes (nominal diameter) from ½-inch to 24-inch; typical practice sizes range from 1-inch to 4-inch; and typical scenario size is 1½-inch. Construct one mile (5,280 feet) of 1½-inch, Class 200 (SDR-9.0, PE4708), HDPE Pipeline with appurtenances, installed below ground with a minimum 1.5 feet of ground cover. Typical size range of pipe installed: 1-inch to 4-inch. The scenario unit is linear feet of pipeline installed. Construct 5,280 feet of 1½-inch, Class 200 (SDR-9.0, PE4708) HDPE pipeline. HDPE pipe weighs 0.475 lb/ft. Appurtenances include: fittings, anchors, thrust blocks, gate valves (2), air release valves (2), drain valve (1), and pressure relief valve (1), and are included in the cost of pipe material (additional 10% of pipe material quantity). Revegetation is not included. Resource Concerns: Inadequate Livestock Water, Inefficient Energy Use. Associated Practices: Critical Area Planting (342), Pumping Plant (533), Watering Facility (614), and Water Harvesting Catchment (636)

Before Situation:

Water supplies need to be conveyed through pipelines for use by livestock or wildlife.

After Situation:

Pipeline(s) convey and/or distribute water to storage and/or watering facilities, for use by livestock or wildlife.

Feature Measure: Length of Pipeline Installed

Scenario Unit: Feet

Scenario Typical Size: 5,280.0

Scenario Total Cost: $15,089.23

Scenario Cost/Unit: $2.86

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Trenching, Pipeline Plowing	1096	Includes equipment and labor for plowing small diameter lines in common earth (< 3")	Feet	$0.99	5280	$5,227.20
Fuser for HDPE Pipe	1383	Fusing machine for 1 to 12 inch diameter HDPE pipe joints. Equipment costs only. Does not include labor.	Hours	$18.30	8	$146.40
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	32	$774.08
Materials						
Pipe, HDPE, smooth wall, weight priced	1379	High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only.	Pound	$3.07	2759	$8,470.13
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 520 - Pond Sealing or Lining, Compacted Soil Treatment

Scenario: #7 - Soil Dispersant - Uncovered

Scenario Description:

Construction of a compacted soil liner, treated with a soil dispersant, to reduce seepage from ponds or waste storage impoundment structures. Practice implementation includes incorporation of the dispersant with the soil liner under proper moisture conditions and compaction to the designed liner thickness. Practice implementation may require filter compatibility with the subgrade (graded filter or geotextile). Associated practice PS378, PS313.

Before Situation:

In-place soils at site exhibit seepage rates in excess of acceptable limits. Soils are suitable for treatment with dispersants.

After Situation:

Water conservation and environmental protection provided by limiting seepage losses from ponds or waste storage impoundments.

Feature Measure: Volume of Liner Material

Scenario Unit: Cubic Yards

Scenario Typical Size: 1,613.0

Scenario Total Cost: $11,094.52

Scenario Cost/Unit: $6.88

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	1613	$6,758.47
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$46.88	6	$281.28
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	8	$211.68
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	8	$362.72
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	2	$222.42
Materials						
Soil Dispersant	1490	Soil Amendment (tetrasodium pyrophosphate (TSPP), sodium tripolyphosphate (STPP), or soda ash or approved equivalent)	Ton	$462.67	6.53	$3,021.24
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	1	$1.00
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 520 - Pond Sealing or Lining, Compacted Soil Treatment

Scenario: #8 - Soil Dispersant - Covered

Scenario Description:

Construction of a compacted soil liner, treated with a soil dispersant, to reduce seepage from ponds or waste storage impoundment structures. Practice implementation includes incorporation of the dispersant with the soil liner under proper moisture conditions, compaction to the designed liner thickness, and placement of soil cover over the treated liner. Practice implementation may require filter compatibility with the subgrade (graded filter or geotextile). Associated practice PS378, PS313.

Before Situation:

In-place soils at site exhibit seepage rates in excess of acceptable limits. Soils are suitable for treatment with dispersants.

After Situation:

Water conservation and environmental protection provided by limiting seepage losses from ponds or waste storage impoundments.

Feature Measure: Volume of Liner Material including

Scenario Unit: Cubic Yards

Scenario Typical Size: 3,226.0

Scenario Total Cost: $17,852.99

Scenario Cost/Unit: $5.53

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	3226	$13,516.94
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$46.88	6	$281.28
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	8	$211.68
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	8	$362.72
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	2	$222.42
Materials						
Soil Dispersant	1490	Soil Amendment (tetrasodium pyrophosphate (TSPP), sodium tripolyphosphate (STPP), or soda ash or approved equivalent)	Ton	$462.67	6.53	$3,021.24
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	1	$1.00
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 520 - Pond Sealing or Lining, Compacted Soil Treatment

Scenario: #9 - Bentonite Treatment - Uncovered

Scenario Description:

Construction of a compacted soil liner, treated with bentonite, to reduce seepage from ponds or waste storage impoundment structures. Practice implementation includes incorporation of the bentonite with the soil under proper moisture conditions, compaction to the designed liner thickness. Practice implementation may require filter compatibility with the subgrade (graded filter or geotextile). Associated practice PS378, PS313.

Before Situation:

In-place soils at site exhibit seepage rates in excess of acceptable limits. Soils are suitable for treatment with dispersants.

After Situation:

Water conservation and environmental protection provided by limiting seepage losses from ponds or waste storage impoundments.

Feature Measure: Volume of Liner Material

Scenario Unit: Cubic Yards

Scenario Typical Size: 1,613.0

Scenario Total Cost: $120,371.03

Scenario Cost/Unit: $74.63

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	1613	$6,758.47
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$46.88	6	$281.28
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	7	$185.22
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	2	$90.68
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	3	$333.63
Materials						
Bentonite	41	Bentonite, includes materials (50# bag)	Each	$21.52	5227	$112,485.04
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	1	$1.00
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 520 - Pond Sealing or Lining, Compacted Soil Treatment

Scenario: #10 - Bentonite Treatment - Covered

Scenario Description:

Construction of a compacted soil liner, treated with bentonite, to reduce seepage from ponds or waste storage impoundment structures. Practice implementation includes incorporation of the bentonite with the soil under proper moisture conditions, compaction to the designed liner thickness, and placement of soil cover over the treated liner. Practice implementation may require filter compatibility with the subgrade (graded filter or geotextile). Associated practice PS378, PS313.

Before Situation:

In-place soils at site exhibit seepage rates in excess of acceptable limits. Soils are suitable for treatment with bentonite.

After Situation:

Water conservation and environmental protection provided by limiting seepage losses from ponds or waste storage impoundments.

Feature Measure: Volume of Liner Material (includes

Scenario Unit: Cubic Yards

Scenario Typical Size: 3,227.0

Scenario Total Cost: $127,133.69

Scenario Cost/Unit: $39.40

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	3227	$13,521.13
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$46.88	6	$281.28
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	7	$185.22
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	2	$90.68
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	3	$333.63
Materials						
Bentonite	41	Bentonite, includes materials (50# bag)	Each	$21.52	5227	$112,485.04
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	1	$1.00
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 520 - Pond Sealing or Lining, Compacted Soil Treatment

Scenario: #11 - Material haul < 1 mile

Scenario Description:

Construction of a compacted soil liner, treated with compacted clay, to reduce seepage from ponds or waste storage impoundment structures. Practice implementation includes compaction of the soil liner under proper moisture conditions to the designed liner thickness, and soil cover to protect the finished liner. Material haul < 1 mile. Associated practices include PS378, PS313, & other waste water impoundments.

Before Situation:

In-place soils at site exhibit seepage rates in excess of acceptable limits. An adequate quantity of soil suitable for constructing a clay liner without amendments is available at an econical haul distance. Material haul < 1 mile.

After Situation:

Water conservation and environmental protection provided by limiting seepage losses from ponds or waste storage impoundments.

Feature Measure: Volume of Liner Material (including

Scenario Unit: Cubic Yards

Scenario Typical Size: 2,420.0

Scenario Total Cost: $25,623.81

Scenario Cost/Unit: $10.59

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	2420	$10,139.80
Excavation, clay, large equipment, 1500 ft	1217	Bulk excavation of clay with scrapers with average haul distance of 1500 feet. Includes equipment and labor.	Cubic Yards	$5.83	1613	$9,403.79
Excavation, common earth, large equipment, 150 ft	1223	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yards	$3.64	807	$2,937.48
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	14	$1,556.94
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	3	$1,350.09

Practice: 520 - Pond Sealing or Lining, Compacted Soil Treatment

Scenario: #12 - Material haul > 1 mile

Scenario Description:

Construction of a compacted soil liner, treated with compacted clay, to reduce seepage from ponds or waste storage impoundment structures. Practice implementation includes compaction of the soil liner under proper moisture conditions to the designed liner thickness, and protection of the finished liner. Material haul > 1 mile. Associated practices include PS378, PS313, & other waste water impoundments.

Before Situation:

In-place soils at site exhibit seepage rates in excess of acceptable limits. An adequate quantity of soil suitable for constructing a clay liner without amendments is available at an economical haul distance.

After Situation:

Water conservation and environmental protection provided by limiting seepage losses from ponds or waste storage impoundments.

Feature Measure: Volume of Liner Material (including

Scenario Unit: Cubic Yards

Scenario Typical Size: 2,420.0

Scenario Total Cost: $30,227.41

Scenario Cost/Unit: $12.49

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	2420	$10,139.80
Track Loader, 95HP	935	Equipment and power unit costs. Labor not included.	Hours	$83.63	20	$1,672.60
Excavation, clay, large equipment, 1500 ft	1217	Bulk excavation of clay with scrapers with average haul distance of 1500 feet. Includes equipment and labor.	Cubic Yards	$5.83	1613	$9,403.79
Excavation, common earth, large equipment, 150 ft	1223	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yards	$3.64	807	$2,937.48
Hauling, bulk, highway truck	1615	Hauling of bulk earthfill, rockfill, waste or debris. One-way travel distance using fully loaded highway dump trucks (typically 16 CY or 20 TN capacity). Includes equipment and labor for truck only. Does not include cost for loading truck.	Cubic Yard Mile	$0.28	8065	$2,258.20
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	20	$672.80
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	14	$1,556.94
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	3	$1,350.09

Practice: 521 - Pond Sealing or Lining, Geomembrane or Geosynthetic Clay Liner

Scenario: #1 - Flexible Membrane - Uncovered without liner drainage or venting

Scenario Description:
Installation of a flexible geosynthetic membrane liner, uncovered, to reduce seepage from ponds or waste storage impoundment structures. Practice implementation includes a geotextile or soil cushion to protect the liner from subgrade damage. Associated practices include PS378 Pond, PS313 Waste Storage Facility.

Before Situation:
In-place soils at site exhibit seepage rates in excess of acceptable limits.

After Situation:
Water conservation and enviromental protection provided by limiting seepage losses from ponds or waste storage impoundments.

Feature Measure: Surface area of Liner Material (incl

Scenario Unit: Square Yard

Scenario Typical Size: 2,420.0

Scenario Total Cost: $23,525.81

Scenario Cost/Unit: $9.72

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.37	2420	$3,315.40
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	40	$1,364.80
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	32	$3,558.72
Materials						
Synthetic Liner, 40 mil	1387	Synthetic 40 mil HDPE, LLDPE, EPDM, etc membrane liner material. Includes materials and shipping only.	Square Yard	$6.29	2420	$15,221.80
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	1	$65.09

Practice: 521 - Pond Sealing or Lining, Geomembrane or Geosynthetic Clay Liner

Scenario: #2 - Flexible Membrane - Uncovered with liner drainage or venting

Scenario Description:

Installation of a flexible geosynthetic membrane liner, uncovered, to reduce seepage from ponds or waste storage impoundment structures. Practice implementation includes a geotextile or soil cushion to protect the liner from subgrade damage, and liner drainage or venting. Associated practices include PS378 Pond, PS313 Waste Storage Facility.

Before Situation:

In-place soils at site exhibit seepage rates in excess of acceptable limits.

After Situation:

Water conservation and enviromental protection provided by limiting seepage losses from ponds or waste storage impoundments.

Feature Measure: Surface area of Liner Material (incl

Scenario Unit: Square Yard

Scenario Typical Size: 2,420.0

Scenario Total Cost: $40,151.21

Scenario Cost/Unit: $16.59

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.37	2420	$3,315.40
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	40	$1,364.80
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	32	$3,558.72
Materials						
Synthetic Liner, 40 mil	1387	Synthetic 40 mil HDPE, LLDPE, EPDM, etc membrane liner material. Includes materials and shipping only.	Square Yard	$6.29	2420	$15,221.80
Geonet	1778	Geosynthetic drainage liner, typically HDPE of 300 mil thickness. Includes materials and shipping only.	Square Yard	$6.87	2420	$16,625.40
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	1	$65.09

Practice: 521 - Pond Sealing or Lining, Geomembrane or Geosynthetic Clay Liner

Scenario: #3 - Flexible Membrane - Covered without liner drainage or venting

Scenario Description:

Installation of a flexible geosynthetic membrane liner to reduce seepage from ponds or waste storage impoundment structures. Practice implementation includes 1 foot of soil cover for liner protection, and a geotextile or soil cushion to protect liner from subgrade damage. Associated practices include PS378 Pond, PS313 Waste Storage Facility.

Before Situation:

In-place soils at site exhibit seepage rates in excess of acceptable limits.

After Situation:

Water conservation and enviromental protection provided by limiting seepage losses from ponds or waste storage impoundments.

Feature Measure: Surface area of Liner Material (incl

Scenario Unit: Square Yard

Scenario Typical Size: 2,420.0

Scenario Total Cost: $27,592.88

Scenario Cost/Unit: $11.40

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.37	2420	$3,315.40
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	807	$3,381.33
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	40	$1,364.80
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	32	$3,558.72
Materials						
Synthetic Liner, 40 mil	1387	Synthetic 40 mil HDPE, LLDPE, EPDM, etc membrane liner material. Includes materials and shipping only.	Square Yard	$6.29	2420	$15,221.80
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	1	$65.09
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	1	$450.03

Practice: 521 - Pond Sealing or Lining, Geomembrane or Geosynthetic Clay Liner

Scenario: #4 - Flexible Membrane - Covered with liner drainage or venting

Scenario Description:

Installation of a flexible geosynthetic membrane liner to reduce seepage from ponds or waste storage impoundment structures. Practice implementation includes 1 foot of soil cover for liner protection, a geotextile or soil cushion to protect liner from subgrade damage, and liner drainage or venting. Associated practices include PS378 Pond, PS313 Waste Storage Facility.

Before Situation:

In-place soils at site exhibit seepage rates in excess of acceptable limits.

After Situation:

Water conservation and enviromental protection provided by limiting seepage losses from ponds or waste storage impoundments.

Feature Measure: Surface area of Liner Material (incl

Scenario Unit: Square Yard

Scenario Typical Size: 2,420.0

Scenario Total Cost: $44,218.28

Scenario Cost/Unit: $18.27

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.37	2420	$3,315.40
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	807	$3,381.33
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	40	$1,364.80
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	32	$3,558.72
Materials						
Synthetic Liner, 40 mil	1387	Synthetic 40 mil HDPE, LLDPE, EPDM, etc membrane liner material. Includes materials and shipping only.	Square Yard	$6.29	2420	$15,221.80
Geonet	1778	Geosynthetic drainage liner, typically HDPE of 300 mil thickness. Includes materials and shipping only.	Square Yard	$6.87	2420	$16,625.40
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	1	$65.09
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	1	$450.03

Practice: 522 - Pond Sealing or Lining - Concrete

Scenario: #19 - Concrete liner, non-reinforced

Scenario Description:

Construction of a non-reinforced concrete liner to reduce seepage losses from ponds or waste storage impoundment structures. A non-reinforced concrete liner is intended to be used where liquid tightness is not required. Practice implementation may require filter compatibility with the subgrade (graded filter or geotextile). Associated Practices: Pond (378), Waste Storage Facility (313), Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Roofs and Covers (367), and Waste Separation Facility (632), Waste Treatment (629), Subsurface Drain (606), Underground Outlet (620), Pumping Plant (533).

Before Situation:

In-place soils at site exhibit seepage rates in excess of acceptable limits and construction of a compacted soil liner is not feasible with available soils.

After Situation:

Water conservation and environmental protection provided by reducing seepage losses from ponds or waste storage impoundments.

Feature Measure: Volume of Concrete liner

Scenario Unit: Cubic Yards

Scenario Typical Size: 278.0

Scenario Total Cost: $64,341.74

Scenario Cost/Unit: $231.45

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formless, non reinforced	36	Non reinforced concrete cast-in-placed without forms by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$184.90	278	$51,402.20
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	278	$1,164.82
Truck, Concrete Pump	1211	Concrete pump, normally truck mounted. Use this item in association with other concrete components when job requires placement by other than normal chutes. Include drive and setup time in quantity; therefore, do not include mobilization. Includes equipment and operator.	Hours	$66.60	10	$666.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	4	$96.76
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic Yards	$28.74	278	$7,989.72
Property/Safety Signs	293	Plastic Fence safety or property sign - Printed on both sides 6 pre-drilled holes for hanging or nailing. 7.5 x 4.75 inch. Includes materials and shipping only.	Each	$1.36	2	$2.72
Structural steel tubing, 2 in. diameter	1120	Structural steel tubing, 2 inch diameter, 1/8 inch wall thickness, materials only	Feet	$4.09	15	$61.35
Waterstop, PVC, ribbed, 3/16 in x 6 in	1614	Waterstop, PVC, ribbed, 3/16 inch thick by 6 inches wide. Includes materials, equipment and labor.	Feet	$4.81	566	$2,722.46
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 522 - Pond Sealing or Lining - Concrete

Scenario: #20 - Concrete liner, reinforced

Scenario Description:

Construction of a reinforced concrete liner to reduce seepage losses from ponds or waste storage impoundment structures. A reinforced concrete liner is intended to be used where liquid tightness is required. Practice implementation may require filter compatibility with the subgrade (graded filter or geotextile). Associated Practices: Pond (378), Waste Storage Facility (313), Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Roofs and Covers (367), and Waste Separation Facility (632), Waste Treatment (629), Subsurface Drain (606), Underground Outlet (620), Pumping Plant (533).

Before Situation:

In-place soils at site exhibit seepage rates in excess of acceptable limits and construction of a compacted soil liner is not feasible with available soils.

After Situation:

Water conservation and environmental protection provided by reducing seepage losses from ponds or waste storage impoundments.

Feature Measure: Volume of Concrete Liner

Scenario Unit: Cubic Yards

Scenario Typical Size: 347.0

Scenario Total Cost: $142,281.66

Scenario Cost/Unit: $410.03

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$372.36	347	$129,208.92
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	278	$1,164.82
Truck, Concrete Pump	1211	Concrete pump, normally truck mounted. Use this item in association with other concrete components when job requires placement by other than normal chutes. Include drive and setup time in quantity; therefore, do not include mobilization. Includes equipment and operator.	Hours	$66.60	12	$799.20
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	4	$96.76
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic Yards	$28.74	278	$7,989.72
Property/Safety Signs	293	Plastic Fence safety or property sign - Printed on both sides 6 pre-drilled holes for hanging or nailing. 7.5 x 4.75 inch. Includes materials and shipping only.	Each	$1.36	2	$2.72
Structural steel tubing, 2 in. diameter	1120	Structural steel tubing, 2 inch diameter, 1/8 inch wall thickness, materials only	Feet	$4.09	15	$61.35
Waterstop, PVC, ribbed, 3/16 in x 6 in	1614	Waterstop, PVC, ribbed, 3/16 inch thick by 6 inches wide. Includes materials, equipment and labor.	Feet	$4.81	566	$2,722.46
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 528 - Prescribed Grazing

Scenario: #1 - Range Standard

Scenario Description:

Design and implementation of a grazing system that will enhance rangeland health and ecosystem function as well as optimize efficiency and economic return through monitoring (ex:photo points, stubble height after grazing, etc) & record keeping.

Before Situation:

Current grazing system exhibits undesirable and inefficient use of forage plants and such use may have a negative impact on rangeland health, as well as soil and water resources. Stocking rates are likely higher than the current level of production and efficiency of use can support without management changes. There is currently no monitoring plan in place to evaluate change on the landscape.

After Situation:

Prescribed grazing system is designed to protect the health and vigor of the plant communities that are in place. Livestock are managed in a way that enhances rangeland health and function through protection of sensitive areas, and efficient harvest of forage resources. Grazing system success will be evaluated through short term monitoring.

Feature Measure: <Unknown>

Scenario Unit: Acres

Scenario Typical Size: 1,000.0

Scenario Total Cost: $4,281.25

Scenario Cost/Unit: $4.28

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Rangeland/grassland field monitoring kit	967	Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only.	Each	$48.65	1	$48.65
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	100	$2,419.00
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	40	$1,813.60

Practice: 528 - Prescribed Grazing

Scenario: #2 - Range Long Term Monitoring

Scenario Description:

Design and implementation of a grazing system that will enhance rangeland health and ecosystem function as well as optimize efficiency and economic return through monitoring (ex: trend, composition, production, etc), record keeping.

Before Situation:

Current grazing system exhibits undesirable and inefficient use of forage plants and such use may have a negative impact on rangeland health, as well as soil and water resources. Stocking rates are likely higher than the current level of production and efficiency of use can support without management changes. There is currently no monitoring plan in place to evaluate change on the landscape.

After Situation:

Prescribed grazing system is designed to protect the health and vigor of the plant communities that are in place. Livestock are managed in a way that enhances rangeland health and function through proper rest and recovery periods, protection of sensitive areas, proper utilization, and efficient harvest of forage resources. Grazing system success will be evaluated through long term monitoring.

Feature Measure: <Unknown>

Scenario Unit: Acres

Scenario Typical Size: 1,000.0

Scenario Total Cost: $9,881.66

Scenario Cost/Unit: $9.88

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$19.49	100	$1,949.00
Rangeland/grassland field monitoring kit	967	Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only.	Each	$48.65	2	$97.30
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	200	$4,838.00
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	60	$2,720.40
Materials						
Nutritional Balance Analyzer, fecal sample analysis only	1127	NIRS fecal analysis, animal performance report. Includes materials and shipping only.	Each	$46.16	6	$276.96

Practice: 528 - Prescribed Grazing

Scenario: #3 - Habitat Mgt. Standard

Scenario Description:

Development and implementation of a grazing schedule that will enhance habitat components for the identified wildlife species of concern.

Before Situation:

Wildlife cover, shelter, food, water and movement are limited due to grazingland condition. Plant health and vigor are negatively impacted by one or more of the following: poor grazing distribution, timing of grazing and inadequate rest and recovery periods. Water quality may be impacted by increased runoff and erosion. In addition reduced vegetative cover increases the opportunity for encroachment of noxious and invasive weeds.

After Situation:

A grazing system is altered and/or enhanced to benefit habitat for targeted wildlife species. Additional benefits include improved rangeland and/or pasture health, protection of sensitive areas, improved water quality and reduced risk of invasive or noxious weed encroachment.

Feature Measure: <Unknown>

Scenario Unit: Acres

Scenario Typical Size: 500.0

Scenario Total Cost: $4,230.75

Scenario Cost/Unit: $8.46

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$19.49	100	$1,949.00
Rangeland/grassland field monitoring kit	967	Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only.	Each	$48.65	1	$48.65
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	30	$1,023.60
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	50	$1,209.50

Practice: 528 - Prescribed Grazing

Scenario: #4 - Habitat Mgt. Long Term Monitoring

Scenario Description:

Development and implementation of a grazing schedule that will enhance habitat components for the identified wildlife species of concern.

Before Situation:

Wildlife cover, shelter, food, water and movement are limited due to grazingland condition. Plant health and vigor are negatively impacted by one or more of the following: poor grazing distribution, timing of grazing and inadequate rest and recovery periods. Water quality may be impacted by increased runoff and erosion. In addition reduced vegetative cover increases the opportunity for encroachment of noxious and invasive weeds.

After Situation:

A grazing system is altered and/or enhanced to benefit habitat for targeted wildlife species. Additional benefits include improved rangeland and/or pasture health, adequate rest and recovery periods, protection of sensitive areas, improved water quality and reduced risk of invasive or noxious weed encroachment. In order to achieve this, implementation of a rest/rotation or deferred grazing system will be required. A portion of the acres will be deferred during periods of critical wildlife use as documented in the grazing plan.

Feature Measure: <Unknown>

Scenario Unit: Acres

Scenario Typical Size: 500.0

Scenario Total Cost: $11,704.50

Scenario Cost/Unit: $23.41

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$109.25	2	$218.50
Equipment Installation						
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$19.49	150	$2,923.50
Rangeland/grassland field monitoring kit	967	Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only.	Each	$48.65	2	$97.30
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	200	$4,838.00
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	80	$3,627.20

Practice: 528 - Prescribed Grazing

Scenario: #5 - Pasture Standard

Scenario Description:

Design and implementation of a grazing system that will enhance pasture condition and ecosystem function as well as optimize efficiency and economic return through monitoring (ex:photo points, stubble height after grazing, etc) & record keeping.

Before Situation:

Current grazing system exhibits undesirable and inefficient use of forage plants and such use may have a negative impact on pasture condition, as well as soil and water resources. Stocking rates are likely higher than the current level of production and efficiency of use can support without management changes. There is currently no monitoring plan in place to evaluate change on the landscape.

After Situation:

Prescribed grazing system is designed to protect the health and vigor of the plant communities that are in place. Livestock are managed in a way that enhances pasture condition and function through protection of sensitive areas, and efficient harvest of forage resources. Grazing system success will be evaluated through short term monitoring.

Feature Measure: <Unknown>

Scenario Unit: Acres

Scenario Typical Size: 160.0

Scenario Total Cost: $2,860.25

Scenario Cost/Unit: $17.88

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Rangeland/grassland field monitoring kit	967	Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only.	Each	$48.65	1	$48.65
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	60	$1,451.40
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	30	$1,360.20

Practice: 528 - Prescribed Grazing

Scenario: #6 - Pasture Intensive

Scenario Description:

Design and implementation of a grazing system that will enhance pasture condition and ecosystem function as well as optimize efficiency and economic return through monitoring (ex: trend, composition, production, etc), record keeping.

Before Situation:

Current grazing system exhibits undesirable and inefficient use of forage plants and such use may have a negative impact on pasture condition, as well as soil and water resources. Stocking rates are likely higher than the current level of production and efficiency of use can support without management changes. There is currently no monitoring plan in place to evaluate change on the landscape.

After Situation:

Prescribed grazing system is designed to protect the health and vigor of the plant communities that are in place. Livestock are managed in a way that enhances pasture condition and function through proper rest and recovery periods, protection of sensitive areas, proper utilization, and efficient harvest of forage resources. Grazing system success will be evaluated through long term monitoring.

Feature Measure: <Unknown>

Scenario Unit: Acres

Scenario Typical Size: 160.0

Scenario Total Cost: $4,380.54

Scenario Cost/Unit: $27.38

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$109.25	2	$218.50
Equipment Installation						
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$19.49	30	$584.70
Rangeland/grassland field monitoring kit	967	Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only.	Each	$48.65	2	$97.30
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	80	$1,935.20
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	30	$1,360.20
Materials						
Nutritional Balance Analyzer, fecal sample analysis only	1127	NIRS fecal analysis, animal performance report. Includes materials and shipping only.	Each	$46.16	4	$184.64

Practice: 528 - Prescribed Grazing

Scenario: #7 - Pasture Deferment

Scenario Description:
Defer the pasture for 90 days and up to a growing season to manage for invasive weeds when necessary, to improve the health of the plants and/or provide nesting habitat for wildlife species. Keep records of dates out and monitor to determine when desired objectives of deferment are met.

Before Situation:
Over-grazed pasture, a pasture with a low condition score, or a newly established pasture converted from cropland with a need for proper grazing management.

After Situation:
Improve the health and vigor of the sward, through deferment of grazing and improve the nesting habitat for wildlife.

Feature Measure: <Unknown>

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $2,838.77

Scenario Cost/Unit: $28.39

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	5	$111.45
Trucking, moving livestock to new paddock	961	Livestock transportation costs to implement a grazing rotation using a gooseneck trailer 6 ft. 8 inch x 24 feet. Includes equipment, power unit and labor costs.	Mile	$3.19	100	$319.00
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$18.46	100	$1,846.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	12	$290.28
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	6	$272.04

Practice: 528 - Prescribed Grazing

Scenario: #8 - Range Deferment

Scenario Description:

Defer Rangeland for up to one year to manage for invasive weeds/brush, prescribed burning, to improve the rangeland health and/or provide nesting habitat for wildlife species. Keep records of dates out and monitor to determine when desired objectives of deferment are met.

Before Situation:

Over-grazed pasture, a native rangeland with declining rangeland health, or a newly established range planting converted from cropland with a need for proper grazing management.

After Situation:

Improve the health and vigor native rangeland, through deferment of grazing and improve the nesting habitat for wildlife.

Feature Measure: <Unknown>

Scenario Unit: Acres

Scenario Typical Size: 500.0

Scenario Total Cost: $4,754.54

Scenario Cost/Unit: $9.51

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	10	$222.90
Trucking, moving livestock to new paddock	961	Livestock transportation costs to implement a grazing rotation using a gooseneck trailer 6 ft. 8 inch x 24 feet. Includes equipment, power unit and labor costs.	Mile	$3.19	200	$638.00
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$18.46	150	$2,769.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	24	$580.56
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	12	$544.08

Practice: 528 - Prescribed Grazing

Scenario: #9 - Targeted Grazing

Scenario Description:

Management of woody non-herbaceous plant species through the use of livestock that are closely herded to concentrate grazing on targeted shrubs. Typical area is moderate rolling to gentle sloping, moderately deep to deep soils that have dense stands of woody non-herbaceous species that exceed the desirable ecological site condition. This scenario is an alternative for organic producers.

Before Situation:

Area consist of dense stands of woody non-herbaceous species that exceed the desirable ecological site condition degrading forage quality, promoting noxious and invasive species, increasing risk of soil erosion and degrading wildlife habitat.

After Situation:

Woody species are grazed to limit the regrowth of shrubs and achieve a desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels.

Feature Measure: Acres Treated

Scenario Unit: Head per day

Scenario Typical Size: 1,500.0

Scenario Total Cost: $3,092.00

Scenario Cost/Unit: $2.06

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	2	$44.58
Trucking, moving livestock to new paddock	961	Livestock transportation costs to implement a grazing rotation using a gooseneck trailer 6 ft. 8 inch x 24 feet. Includes equipment, power unit and labor costs.	Mile	$3.19	200	$638.00
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$19.49	8	$155.92
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	50	$1,209.50
Materials						
Animals used for biological weed control	1130	Goats, Llamas, Sheep - Includes all support: fence, water, dog, mob, etc. Includes materials and shipping only.	Head per day	$6.96	150	$1,044.00

Practice: 533 - Pumping Plant

Scenario: #1 - Electric-Powered Pump <= 5 Hp

Scenario Description:

A 2.5 Hp submersible electric-powered pump is installed in a well or structure; or a close-coupled 1 Hp electric-powered centrifugal pump is mounted on a platform. It is used for watering livestock as part of a prescribed grazing system; or for pressurizing a small irrigation system; or for transferring liquid waste in a waste transfer system. Resource Concerns: Livestock Production Limitation - Inadequate livestock water; Water Quality degradation - Excess nutrients in surface and ground waters; Insufficient water - Inefficient use of irrigation water. Associated Practices include: 374 - Farmstead Energy Improvement; 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 449 - Irrigation Water Management; 516 - Livestock Pipeline; 313 - Waste Storage Facility; 634 - Waste Transfer; and 614 - Watering Facility.

Before Situation:

Livestock: The present gravity flow system is inadequate to provide the proper flow rate for a prescribed grazing system. Irrigation: Available water is at an insufficient pressure to allow for even distribution of water. Waste Transfer: Contaminated water needs to be moved to a containment facility.

After Situation:

Livestock: Water is transferred at a sufficient rate and pressure to meet the requirements of a prescribed grazing system. Irrigation: A properly designed pump is installed to improve irrigation efficiency and reduce energy usage. Waste Transfer: Liquid wastes that have been collected through a waste transfer system are now efficiently transferred to an appropriate treatment or storage facility.

Feature Measure: Pump Power Requirement

Scenario Unit: Horsepower

Scenario Typical Size: 2.5

Scenario Total Cost: $2,459.12

Scenario Cost/Unit: $983.65

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$372.36	0.25	$93.09
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	2	$44.58
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	6	$145.14
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	6	$272.04
Materials						
Pump, <= 5 HP, pump and motor, fixed cost portion	1009	Fixed cost portion of a pump less than or equal to 5 HP pump and motor. This portion is a base cost and is not dependant on horsepower. The total cost of any pump will include this fixed cost plus a variable cost portion. The completed pump and motor will include the motor and controls. Includes material and shipping only.	Each	$1,019.47	1	$1,019.47
Pump, <= 5 HP, pump and motor, variable cost portion	1010	Variable cost portion of a pump less than or equal to 5 HP pump and motor. This portion IS dependent on the total horsepower for the pump. The total cost of any pump will include this variable cost plus the fixed cost portion. The completed pump and motor will include the motor and controls. Includes material and shipping only.	Horsepower	$353.92	2.5	$884.80

Practice: 533 - Pumping Plant

Scenario: #2 - Electric-Powered Pump <= 5 HP with Pressure Tank

Scenario Description:

A 1 Hp submersible electric-powered pump is installed in a well or structure; or a close-coupled 1 Hp electric-powered centrifugal pump is mounted on a platform. It is used for watering livestock as part of a prescribed grazing system; or for pressurizing a small irrigation system. Resource Concerns: Livestock Production Limitation - Inadequate livestock water; Insufficient water - Inefficient use of irrigation water. Associated Practices include: 374 - Farmstead Energy Improvement; 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 449 - Irrigation Water Management; 516 - Livestock Pipeline.

Before Situation:

Livestock: The present gravity flow system is inadequate to provide the proper flow rate for a prescribed grazing system. Irrigation: Available water is at an insufficient pressure to allow for even distribution of water.

After Situation:

Livestock: Water is transferred at a sufficient rate and pressure to meet the requirements of a prescribed grazing system. Irrigation: A properly designed pump is installed to improve irrigation efficiency and reduce energy usage.

Feature Measure: Pump Power Requirement

Scenario Unit: Horsepower

Scenario Typical Size: 1.0

Scenario Total Cost: $2,276.91

Scenario Cost/Unit: $2,276.91

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$372.36	0.25	$93.09
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	2	$44.58
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	6	$145.14
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	6	$272.04
Materials						
Pump, <= 5 HP, pump and motor, fixed cost portion	1009	Fixed cost portion of a pump less than or equal to 5 HP pump and motor. This portion is a base cost and is not dependant on horsepower. The total cost of any pump will include this fixed cost plus a variable cost portion. The completed pump and motor will include the motor and controls. Includes material and shipping only.	Each	$1,019.47	1	$1,019.47
Pump, <= 5 HP, pump and motor, variable cost portion	1010	Variable cost portion of a pump less than or equal to 5 HP pump and motor. This portion IS dependent on the total horsepower for the pump. The total cost of any pump will include this variable cost plus the fixed cost portion. The completed pump and motor will include the motor and controls. Includes material and shipping only.	Horsepower	$353.92	1	$353.92
Pressure Tank, 40 gallon	1038	Pressure Tank, 40 gallon. Includes materials and shipping only.	Each	$348.67	1	$348.67

Practice: 533 - Pumping Plant

Scenario: #3 - Electric-Powered Pump 5-10 HP

Scenario Description:

A 7.5 hp submersible electric-powered pump is installed in a well or structure; or a close-coupled electric-powered centrifugal pump is mounted on a platform. Resource Concerns: Water Quality degradation - Excess nutrients in surface and ground waters; Insufficient water - Inefficient use of irrigation water. Associated Practices include: 374 - Farmstead Energy Improvement; 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 449 - Irrigation Water Management; 313 - Waste Storage Facility; and 634 - Waste Transfer.

Before Situation:

Irrigation: An existing irrigation system employs an inefficient, improperly sized pump that prevents efficient water application resulting in water loss and high energy use.

After Situation:

Irrigation: A properly designed and efficient pumping plant is installed, reducing energy use and improving irrigation efficiency.

Feature Measure: Pump Power Requirement

Scenario Unit: Horsepower

Scenario Typical Size: 7.5

Scenario Total Cost: $10,532.24

Scenario Cost/Unit: $1,404.30

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$372.36	1	$372.36
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$29.47	8	$235.76
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	56	$1,248.24
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	8	$272.96
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	56	$1,354.64
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	8	$269.12
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	56	$2,539.04
Materials						
Pump, > 5 HP to 30 HP, pump and motor, fixed cost portion	1011	Fixed cost portion of a pump between 5 and 30 HP, including the pump and motor. This portion is a base cost for the pump and is not dependant on horsepower. The total cost will include this fixed cost plus a variable cost portion. Includes material and shipping only.	Each	$2,367.02	1	$2,367.02
Pump, > 5 HP to 30 HP, pump and motor, variable cost portion	1012	Variable cost portion of a pump between 5 and 30 HP, including the pump and motor. This portion is dependent on the total horsepower for the pump. The total cost will include this variable cost plus a fixed cost portion. Includes material and shipping only.	Horsepower	$186.89	7.5	$1,401.68
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 533 - Pumping Plant

Scenario: #4 - Internal Combustion-Powered Pump10 to 50HP

Scenario Description:

The typical scenario supports installation of a pump in an existing irrigation system or installation of a new pump on cropland with a 30 BHP pump. Size of pump is determined by required GPM and pressure derived from a design for specific irrigation system on cropland. The combination of higher solids content and volume require a larger horse power pump. This liquid manure pump is used to transfer semi-solid manure from a small reception pit located either below a barnyard or at the end of a free-stall barn or scrape alley. Resource Concerns: Water Quality degradation - Excess nutrients in surface and ground waters; Insufficient water - Inefficient use of irrigation water. Associated Practices include: 374 - Farmstead Energy Improvement; 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 449 - Irrigation Water Management; 313 - Waste Storage Facility; 634 - Waste Transfer; 436 - Irrigation Reservoir; and 447 - Irrigation System, Tailwater Recovery; and 614 - Watering Facility.

Before Situation:

Irrigation: Either an existing irrigation system employs an inefficient, improperly-sized pump that leads to inefficient water delivery resulting in high energy costs, or Waste Transfer: various types of semi-solid or liquid waste at the headquarters is uncollected causing surface and ground water issues.

After Situation:

Irrigation Setting: For irrigation system, a properly designed pump is installed, reducing water and energy usage. Waste Transfer Setting: For semi-solid or liquid waste, wastes that have been collected through a waste transfer system are now efficiently transferred to appropriate treatment or storage facilities or crop application. Due to topography, gravity transfer is not possible and a properly sized pump is needed to transfer waste as part of a waste transfer system.

Feature Measure: Pump Power Requirement

Scenario Unit: Horsepower

Scenario Typical Size: 30.0

Scenario Total Cost: $21,873.66

Scenario Cost/Unit: $729.12

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$372.36	2	$744.72
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$29.47	8	$235.76
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	4	$89.16
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	8	$272.96
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	32	$774.08
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	8	$269.12
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	16	$725.44
Materials						
Pump, < 50 HP, Pump & ICE power unit	1027	Materials, labor, controls: < 50 HP Pump & ICE power unit	Horsepower	$609.70	30	$18,291.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 533 - Pumping Plant

Scenario: #5 - Variable Frequency Drive

Scenario Description:

This is an installation of electrical and electronic components designed to vary the frequency of the voltage to an electric motor and thus the ability to vary the speed of the motor. This directly affects pressure and flowrate. This also could give the operator the flexibility to operate several systems separately or at the same time. Resource concerns: Insufficient water - Inefficient use of irrigation water; Inefficient energy use - Equipment and facilities and Farming/ranching practices and field operations. Associated Practices: 374 - Farmstead Energy Improvement; 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 449 - Irrigation Water Management; 516 - Livestock Pipeline; and 614 - Watering Facility.

Before Situation:

Standard electrical connection from electrical utility to pump motor. No capability to match pump output pressure and/or flowrate to field(s) need(s). Result is over/under pressure(s) and/or flow rate(s), possible hydraulic anomalies, energy loss, and or inefficient water application in the irrigation system.

After Situation:

VFD Modifications are implemented at the pump site to allow for varying the speed of a 50 Hp electric motor to match the pressure and flow requirements for a center pivot irrigation system.

Feature Measure: Pump Power Requirement

Scenario Unit: Horsepower

Scenario Typical Size: 50.0

Scenario Total Cost: $5,470.46

Scenario Cost/Unit: $109.41

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	8	$272.96
Materials						
Variable Speed Drive, 50 HP	1288	Variable speed drive for 50 Horsepower electric motor. Does not include motor. Materials only.	Horsepower	$103.95	50	$5,197.50

Practice: 533 - Pumping Plant

Scenario: #7 - Internal Combustion-Powered Pump > 50 to 70 HP

Scenario Description:

The typical scenario supports installation of a pump in an existing irrigation system or installation of a new pump on cropland with a 60 BHP pump. Size of pump is determined by required GPM and pressure derived from a design for specific irrigation system on cropland. The combination of higher solids content and volume require a larger horse power pump. This liquid manure pump is used to transfer semi-solid manure from a small reception pit located either below a barnyard or at the end of a free-stall barn or scrape alley. Resource Concerns: Water Quality degradation - Excess nutrients in surface and ground waters; Insufficient water - Inefficient use of irrigation water. Associated Practices include: 374 - Farmstead Energy Improvement; 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 449 - Irrigation Water Management; 313 - Waste Storage Facility; 634 - Waste Transfer; 436 - Irrigation Reservoir; and 447 - Irrigation System, Tailwater Recovery; and 614 - Watering Facility.

Before Situation:

Irrigation: Either an existing irrigation system employs an inefficient, improperly-sized pump that leads to inefficient water delivery resulting in high energy costs, or Waste Transfer: various types of semi-solid or liquid waste at the headquarters is uncollected causing surface and ground water issues.

After Situation:

Irrigation Setting: For irrigation system, a properly designed pump is installed, reducing water and energy usage. Waste Transfer Setting: For semi-solid or liquid waste, wastes that have been collected through a waste transfer system are now efficiently transferred to appropriate treatment or storage facilities or crop application. Due to topography, gravity transfer is not possible and a properly sized pump is needed to transfer waste as part of a waste transfer system.

Feature Measure: Pump Power Requirement

Scenario Unit: Horsepower

Scenario Typical Size: 60.0

Scenario Total Cost: $39,219.30

Scenario Cost/Unit: $653.66

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$372.36	1	$372.36
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$29.47	8	$235.76
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	4	$89.16
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	8	$272.96
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	32	$774.08
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	8	$269.12
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	16	$725.44
Materials						
Pump, > 50 to 70 HP, Pump & ICE power unit	1028	Materials, labor, controls: > 50 to 70 HP Pump & ICE power unit	Horsepower	$600.15	60	$36,009.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 533 - Pumping Plant

Scenario: #8 - Internal Combustion-Powered Pump > 70 HP

Scenario Description:

The typical scenario supports replacement of a pump in an existing irrigation system or installation of a new pump on cropland that is 75 break HP pump or larger. Size of pump is determined by required GPM and pressure derived from a design for specific irrigation system on cropland. Scenario could also be used for a pump for silage leachate, barnyard runoff, and milk house waste (as part of a waste transfer system) at farm headquarters. Resource Concerns: Water Quality degradation - Excess nutrients in surface and ground waters; Insufficient water - Inefficient use of irrigation water. Associated Practices include: 374 - Farmstead Energy Improvement; 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 449 - Irrigation Water Management; 313 - Waste Storage Facility; 634 - Waste Transfer; and 614 - Watering Facility.

Before Situation:

Irrigation: Either an existing irrigation system employs an inefficient, improperly-sized pump that leads to inefficient water delivery resulting in high energy costs, or Waste Transfer: various types of semi-solid or liquid waste at the headquarters is uncollected causing surface and ground water issues.

After Situation:

Irrigation Setting: For irrigation system, a properly designed pump is installed, reducing water and energy usage. Waste Transfer Setting: For semi-solid or liquid waste, wastes that have been collected through a waste transfer system are now efficiently transferred to appropriate treatment or storage facilities or crop application. Due to topography, gravity transfer is not possible and a properly sized pump is needed to transfer waste as part of a waste transfer system.

Feature Measure: Pump Power Requirement

Scenario Unit: Horsepower

Scenario Typical Size: 100.0

Scenario Total Cost: $64,399.00

Scenario Cost/Unit: $643.99

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$372.36	2	$744.72
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$29.47	8	$235.76
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	6	$133.74
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	8	$272.96
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	48	$1,161.12
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	8	$269.12
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	24	$1,088.16
Materials						
Pump, > 70 HP, Pump & ICE power unit	1029	Materials, labor, controls: > 70 HP Pump & ICE power unit	Horsepower	$600.22	100	$60,022.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 533 - Pumping Plant

Scenario: #9 - Tractor Power Take Off (PTO) Pump

Scenario Description:

This scenario involves a PTO driven pump to either transfer water for an irrigation system from a Pond - 378 (includes backflow prevention as appropriate) to cropland or; to transfer semi-solid/ liquid manure (as part of a waste transfer system) at the farm headquarters from a Waste Storage Facility - 313, to an irrigation system or waste treatment facility. In both cases, a PTO driven pump is selected because the landowner has equipment available to supply power to the pump. Electricity is not readily available and/or a stationary engine is not a practical alternative. Resource Concerns: Water Quality degradation - Excess nutrients in surface and ground waters; Insufficient water - Inefficient use of irrigation water. Associated Practices include: 430 - Irrigation Pipeline; 442 - Irrigation System, Sprinkler; 449 - Irrigation Water Management; 590 - Nutrient Management; 378 - Pond; 313 - Waste Storage Facility; and 634 - Waste Transfer.

Before Situation:

Irrigation Setting: An existing surface irrigation system employs an inefficient, improperly sized pump that leads to inefficient water delivery resulting in high energy costs; Waste Transfer Setting: various types of semi-solid or liquid waste at the headquarters are uncollected causing surface and ground water issues. A transfer method for waste is needed. Due to topography, gravity transfer is not possible and a properly sized pump is needed to transfer waste as part of a waste transfer system.

After Situation:

Irrigation Setting: A properly designed PTO-driven pump is installed, to transfer water to an Irrigation Pipeline (430) or Irrigation Canal or Lateral (320). Waste Transfer Setting: Wastes that have been collected through a waste transfer system are now efficiently transferred from a Waste Storage Facility (313) to an appropriate treatment facility or to an irrigation system. The pump typically will move 2,000 gallons per minute and is portable so that it can be used at several locations.

Feature Measure: Pump Power Requirement

Scenario Unit: Horsepower

Scenario Typical Size: 60.0

Scenario Total Cost: $10,161.14

Scenario Cost/Unit: $169.35

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$372.36	2	$744.72
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	16	$356.64
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	16	$387.04
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	16	$725.44
Materials						
Pump, Ag Water PTO, 1,000 GPM	1923	Materials, labor, controls: Ag Water PTO Pump 1,000 GPM - 8 in.	Each	$7,947.30	1	$7,947.30

Practice: 533 - Pumping Plant

Scenario: #10 - Windmill-Powered Pump

Scenario Description:

A windmill is installed in order to supply a reliable water source for livestock and/or wildlife. The windmill includes the tower, concrete footings, wheel blade unit, sucker rod, down pipe, gear box, pump, plumbing, and well head protection concrete pad. The typical scenario will be a windmill system with a 10 ft diameter mill and 27-foot tower which is pumping from a 150-foot well. As a result of installing this windmill, resource concerns of inadequate stock water, plant establishment, growth, productivity, health, and vigor, and water quantity can be addressed. Resource Concerns: Insufficient stockwater.

Before Situation:

In a rangeland or pasture setting, a reliable source of water for livestock is not available, or the spacing between water sources is such that grazing distribution and plant health are adversely impacted.

After Situation:

A windmill, with a wheel ranging from 6' to 16' in diameter, will be installed over a well that is located to provide a reliable source of livestock water at the rate of at least 2 gpm, to facilitate proper grazing distribution and improved plant health. To increase reliability, water is pumped into a storage tank to provide a given number of days of supply. Installation includes the footings, wellhead protection concrete pad, tower, gear box, sail, sucker rod, down hole accessories, and a short outlet pipe to a storage tank.

Feature Measure: Diameter of Mill Wheel

Scenario Unit: Feet

Scenario Typical Size: 10.0

Scenario Total Cost: $10,639.80

Scenario Cost/Unit: $1,063.98

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$372.36	2	$744.72
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	4	$89.16
Aerial lift, telescoping bucket	1893	Aerial lift, bucket truck or cherry picker, typical 40' boom. Equipment only.	Hours	$35.36	8	$282.88
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	32	$774.08
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	16	$725.44
Materials						
Windmill, 10 ft. fan diameter	1036	Includes materials costs for windmill head and 27 foot tower	Each	$7,552.10	1	$7,552.10
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 533 - Pumping Plant

Scenario: #14 - Photovoltaic-Powered Pump - Remote Locations

Scenario Description:

The typical scenario assumes installation of a submersible solar-powered pump in a well or a live stream in remote areas at least 50 miles or more from source of equipment and/or materials. The installation includes the pump, wiring, drop pipe, solar panels, mounts, inverter, and all appurtenances. Note: It is generally not advisable to use a storage battery for a number of reasons. A storage tank is generally the most efficient method to store energy. Grazing - Livestock exclusion from surface water will result in improved surface water quality and reduced erosion. Irrigation - energy consumption will be reduced and the increased pressure and flow rates will improve irrigation efficiency. Resource Concerns: Insufficient stockwater. Associated Practices include: 374 - Farmstead Energy Improvement; 382 - Fence; 430 - Irrigation Pipeline; 436 - Irrigation Reservoir; 516 - Livestock Pipeline; 561 - Heavy Use Area Protection; and, 614 - Watering Facility.

Before Situation:

Livestock: Inadequate supply or location of water for a prescribed grazing system. Eroded stream banks and degraded water quality due to livestock access to stream. Cattle are not well-distributed because of remote water location. Irrigation: Pressure and flow rate is insufficient for uniform irrigation.

After Situation:

The typical scenario assumes installation of 250 watts of photovoltaic (PV) panels, capable of operating a 1/4 Hp (0.25 Hp) solar-powered submersible pump in a well or other water source (Notes: 1) A PV panel is rated under standard and ideal conditions which will most likely not be replicated in the field; 2) 1 Hp is defined as 746 watts; 3) It is reasonable to expect a 1/4 Hp solar-powered submersible pump to deliver about 1.5 gpm and develop a pressure at the pump outlet of about 60 psi.). The installation includes the pump, wiring, pipeline in the well, solar panels, frame mounts, inverter, and all appurtenances. Water will be pumped to an existing storage tank at a higher elevation from which it will be used to pressurize the Livestock Pipeline (516) or Irrigation Pipeline (430). Grazing - Livestock exclusion from surface water will result in improved surface water quality and reduced erosion. Grazing has potential to be well distributed. Irrigation: Improved pressure and flow rate will improve irrigation efficiency.

Feature Measure: Pump Power Requirement

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $3,857.78

Scenario Cost/Unit: $3,857.78

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	16	$356.64
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	16	$387.04
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	16	$725.44
Materials						
Pump, <= 5 HP, pump and motor, fixed cost portion	1009	Fixed cost portion of a pump less than or equal to 5 HP pump and motor. This portion is a base cost and is not dependant on horsepower. The total cost of any pump will include this fixed cost plus a variable cost portion. The completed pump and motor will include the motor and controls. Includes material and shipping only.	Each	$1,019.47	1	$1,019.47
Pump, <= 5 HP, pump and motor, variable cost portion	1010	Variable cost portion of a pump less than or equal to 5 HP pump and motor. This portion IS dependent on the total horsepower for the pump. The total cost of any pump will include this variable cost plus the fixed cost portion. The completed pump and motor will include the motor and controls. Includes material and shipping only.	Horsepower	$353.92	0.25	$88.48
Solar Panels, fixed cost portion	1031	Fixed cost portion of the Solar Panels. This portion is a base cost for all Solar Panels and is not dependant on KiloWatt. The total cost of any Solar Panels will include this fixed cost plus a variable cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drops and etc). This cost will include material, labor and equipment.	Each	$273.31	1	$273.31
Solar Panels, variable cost portion	1135	Variable cost portion of the Solar Panels. This portion IS dependent on the total Kilowatt for the Solar Panels. The total cost of any Solar Panels will include this variable cost plus the fixed cost portion. The completed Solar Panels will include all materials (electrical, controllers, and service drop, etc). This cost will include material, labor and equipment.	Kilowatt	$2,429.59	0.25	$607.40
Mobilization						

Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	400	$400.00

Practice: 533 - Pumping Plant

Scenario: #15 - Water Ram Pump

Scenario Description:

A water ram is used to transfer water from a live stream to a Watering Facility (614) or small Irrigation Reservoir (436) utilizing the energy of moving water to transfer a portion of that water to a higher elevation. It is anchored to a small concrete pad. Bypass water (which could easily be 90% of the water diverted from the stream) is returned to the stream or transferred in a pipe, to a lower elevation tank (614 or 436), without erosion or impairment to water quality. In the livestock scenario, the objective is to provide water to the cattle outside of a live stream or other natural water source thereby eliminating a significant erosion situation while also improving water quality. The cattle thus have access to drinking water without having to enter the stream. The water ram may need to be fenced for protection from curious bovines. While it is generally not considered practical for irrigation, in the irrigation scenario, water can be retrieved from a stream and stored in a small 436 to provide water for a very small (0.1 acre) irrigation system. Resource Concerns: Insufficient stockwater. Associated Practices: 374 - Farmstead Energy Improvement; 382 - Fence; 430 - Irrigation Pipeline; 436 - Irrigation Reservoir; 516 - Livestock Pipeline; 561 - Heavy Use Area Protection; and, 614 - Watering Facility.

Before Situation:

Water in a nearby stream is not available at the desired location, pressure and/or flow rate.

After Situation:

A 2" diameter inlet pipe is installed and connected to a water ram pump with all appurtenances and anchored to a concrete pad (9 ft x 4 ft x 5 in) or other appropriate secure base. Depending upon the application, either a 1-inch diameter Livestock Pipeline (516) or an Irrigation Pipeline (430) is installed from the water ram to a 5,000 gallon storage facility. Improved water quantity or quality, grazing management, plant diversity, animal health, and/or irrigation purposes as outlined in the appropriate NRCS irrigation system standard. A 2" water ram, with 10 gpm of inlet flow and 10 feet of drop, can supply about 1.0 gpm to a location about 50 feet higher than the water ram.

Feature Measure: Number of Ram Pumps

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $2,537.42

Scenario Cost/Unit: $2,537.42

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$372.36	0.5	$186.18
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	16	$356.64
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	16	$387.04
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	16	$725.44
Materials						
Pump, Ram	1114	Ram pump kit, 2 inch. Includes materials and shipping only.	Each	$882.12	1	$882.12

Practice: 533 - Pumping Plant

Scenario: #16 - Livestock Nose Pump

Scenario Description:

A Nose Pump is a diaphragm pump located in a pasture for the purpose of providing water to cattle. For a permanent installation, it is typical to also install Heavy Use Area Protection (561) (separate contract item) where the cattle congregate around the pump. It is powered and operated by cattle to transfer water from a stream to a drinking bowl. The objective is to provide water to the cattle outside of a live stream or other natural water source thereby eliminating a significant erosion situation and while also improving water quality. The cattle thus have access to drinking water without having to enter the stream. Generally one nose pump is adequate for 20 cattle. Resource Concerns: Insufficient stockwater; Inefficient energy use - Equipment and facilities. Associated Practices include: 374 - Farmstead Energy Improvement; 382 - Fence; 516 - Livestock Pipeline; 561 - Heavy Use Area Protection; and, 614 - Watering Facility.

Before Situation:

Livestock have open access to a live stream or other existing natural water supply. Water supply is contaminated due to animal activity and stream banks are eroded on a daily basis. Improper cattle distribution results in poor water quality, poor grazing distribution, over grazing, and soil erosion.

After Situation:

One nose pump is installed with all appurtenances anchored to concrete pad with 6"x6"x10 Gauge reinforcement wire (9 ft x 4 ft x 5 in) or other appropriate secure base to supply water to cattle for improved livestock herd management. Additional Heavy Use Area Protection (561) in the form of crushed rock and at least 5 feet wide, may be installed (separate contract item) surrounding the concrete pad. Improved: water quality, soil quality, grazing management, plant diversity, and animal health.

Feature Measure: Number of Pumps

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $1,332.98

Scenario Cost/Unit: $1,332.98

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$372.36	0.5	$186.18
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	8	$178.32
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	8	$193.52
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	8	$362.72
Materials						
Nose Pump	1052	Materials and delivery.	Each	$412.24	1	$412.24

Practice: 533 - Pumping Plant

Scenario: #17 - Rebowling

Scenario Description:

Descripton: This scenario includes the modification and/or replacement of vertical turbine pumps in existing active wells to ensure that pumping plant performance is matched to the designed operating requirements of the appurtenant irrigation system and aquifer condtions. This practice is typically done concurrently with a conversion of an irrigation system and is not intended to substitute for normal maintenance activities. This scenario includes an inventory of existing pump data and performing a pump test if sufficient performance data for the exisitng pump cannot be provided. This scenario includes all materials, equipment, and labor to test and repair the inner column of the pumpm assembly and rebowling. Associated practices include: 441- Irrigation System, Microirrigation; 442- Irrigation System, Sprinkler; 443- Irrigation System, Surface

Before Situation:

120 acres of cropland that is being irrigated with a pump that is no longer matched to the operating conditions of the appurtenant system due to improvements in the irrigation system or changes in flow rate or water surface levels due to aquifer depletion.

After Situation:

120 acres of cropland that is being irrigated with a modified pump that is matched to irrigation system and aquifer conditions

Feature Measure: Number of Pumps

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $15,820.40

Scenario Cost/Unit: $15,820.40

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	16	$356.64
Aerial lift, telescoping bucket	1893	Aerial lift, bucket truck or cherry picker, typical 40' boom. Equipment only.	Hours	$35.36	16	$565.76
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	32	$774.08
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	16	$725.44
Materials						
Pump, Bowl replacement, 30 to 100 HP	1984	Includes all material and shop labor to replace/service the entire set of bowls for a vertical turbine pump, install new bowls as necessary, and all appurtenances and materials to connect to the existing well column. Typical of 100 to 300 feet of column depth, 400 to 800 gpm discharge at 30 to 50 psi. Does not include labor and equipment to remove and install the assembled pump from the well.	Horsepower	$111.58	100	$11,158.00
Swing Check Valve, metal, 8 in.	2080	8 inch swing check valve for back flow prevention, ductile iron metal body with flange mount and lever shaft. Materials only.	Each	$2,004.77	1	$2,004.77
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 533 - Pumping Plant

Scenario: #55 - Electric Power Pump 10 to 30 hp

Scenario Description:

This is a close-coupled, 3-phase, 25 Hp electric-powered centrifugal pump mounted on a platform for pressurizing a medium-sized (600 gpm and 50 psi) sprinkler or large microirrigation (850 gpm and 35 psi) system or a large-sized surface irrigaiton system (1,200 gpm) or a large-sized (1,200 gpm and 25 psi) waste transfer system. Resource Concerns: Water Quality degradation - Excess nutrients in surface and ground waters; Insufficient water - Inefficient use of irrigation water. Associated Practices: 374 - Farmstead Energy Improvement; 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 449 - Irrigation Water Management; 313 - Waste Storage Facility; 634 - Waste Transfer; and 614 - Watering Facility.

Before Situation:

Irrigation: An existing irrigation system employs an inefficient, improperly sized pump that prevents efficient water application resulting in water loss and high energy use. Waste Transfer: Various types of semi-solid or liquid waste are uncollected causing surface and ground water issues. Due to topography, gravity transfer is not possible and a properly sized pump is needed to transfer waste as part of a waste transfer system.

After Situation:

Irrigation: A properly designed and efficient pumping plant is installed, reducing energy use and improving irrigation efficiency. Waste Transfer: Collected wastes are now efficiently transferred to an appropriate treatment or storage facility or to a distribution system.

Feature Measure: Horsepower

Scenario Unit: Horsepower

Scenario Typical Size: 25.0

Scenario Total Cost: $9,978.27

Scenario Cost/Unit: $399.13

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$372.36	2	$744.72
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$29.47	4	$117.88
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	8	$178.32
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	12	$409.44
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	12	$290.28
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	4	$134.56
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	6	$272.04
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	5	$556.05
Materials						
Pump, > 5 HP to 30 HP, pump and motor, fixed cost portion	1011	Fixed cost portion of a pump between 5 and 30 HP, including the pump and motor. This portion is a base cost for the pump and is not dependant on horsepower. The total cost will include this fixed cost plus a variable cost portion. Includes material and shipping only.	Each	$2,367.02	1	$2,367.02
Pump, > 5 HP to 30 HP, pump and motor, variable cost portion	1012	Variable cost portion of a pump between 5 and 30 HP, including the pump and motor. This portion is dependent on the total horsepower for the pump. The total cost will include this variable cost plus a fixed cost portion. Includes material and shipping only.	Horsepower	$186.89	25	$4,672.25
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 533 - Pumping Plant

Scenario: #56 - Electric Power Pump Greater than 30 hp

Scenario Description:

This is a close-coupled, 3-phase, 40 Hp electric-powered centrifugal pump mounted on a platform for pressurizing a large-sized (1,200 gpm and 50 psi) sprinkler or very large microirrigation (1,700 gpm and 35 psi) system or a very large-sized surface irrigation system (2,800 gpm) or a very large-sized (2,400 gpm and 25 psi) waste transfer system. Resource Concerns: Water Quality degradation - Excess nutrients in surface and ground waters; Insufficient water - Inefficient use of irrigation water. Associated Practices: 374 - Farmstead Energy Improvement; 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 449 - Irrigation Water Management; 313 - Waste Storage Facility; and 634 - Waste Transfer.

Before Situation:

Irrigation: An existing irrigation system employs an inefficient, improperly sized pump that prevents efficient water application resulting in water loss and high energy use.

After Situation:

Irrigation: A properly designed and efficient pumping plant is installed, reducing energy use and improving irrigation efficiency.

Feature Measure: Pump Power Requirement

Scenario Unit: Horsepower

Scenario Typical Size: 40.0

Scenario Total Cost: $13,498.21

Scenario Cost/Unit: $337.46

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$372.36	2	$744.72
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$29.47	6	$176.82
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	12	$267.48
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	16	$387.04
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	6	$201.84
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	6	$272.04
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	6	$667.26
Materials						
Pump, > 30 HP, pump and motor, fixed cost portion	1013	Fixed cost portion of a pump greater than 30 HP, including the pump and motor. This portion is a base cost for the pump and is not dependant on horsepower. The total cost will include this fixed cost plus a variable cost portion. Includes material and shipping only.	Each	$3,141.30	1	$3,141.30
Pump, >30 HP, Pump and motor, variable cost portion	1014	Variable cost portion of a pump greater than 30 HP, including the pump and motor. This portion is dependent on the total horsepower for the pump. The total cost will include this variable cost plus a fixed cost portion. IIncludes material and shipping only.	Horsepower	$185.10	40	$7,404.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 533 - Pumping Plant

Scenario: #57 - Photovoltaic Pump Less Than or Equal to 250 Watts

Scenario Description:

The typical scenario assumes installation of a submersible solar-powered pump in a well or a live stream. The installation includes the pump, wiring, drop pipe, solar panels, mounts, inverter, and all appurtenances. Note: It is generally not advisable to use a storage battery for a number of reasons. A storage tank is generally the most efficient method to store energy. Grazing - Livestock exclusion from surface water will result in improved surface water quality and reduced erosion. Irrigation - energy consumption will be reduced and the increased pressure and flow rates will improve irrigation efficiency. Resource Concerns: Insufficient stockwater. Associated Practices include: 374 - Farmstead Energy Improvement; 382 - Fence; 430 - Irrigation Pipeline; 436 - Irrigation Reservoir; 516 - Livestock Pipeline; 561 - Heavy Use Area Protection; and, 614 - Watering Facility.

Before Situation:

Livestock: Inadequate supply or location of water for a prescribed grazing system. Eroded stream banks and degraded water quality due to livestock access to stream. Cattle are not well-distributed because of remote water location. Irrigation: Pressure and flow rate is insufficient for uniform irrigation.

After Situation:

The typical scenario assumes installation of 250 watts of photovoltaic (PV) panels, capable of operating a 1/4 Hp (0.25 Hp) solar-powered submersible pump in a well or other water source (Notes: 1) A PV panel is rated under standard and ideal conditions which will most likely not be replicated in the field; 2) 1 Hp is defined as 746 watts; 3) It is reasonable to expect a 1/4 Hp solar-powered submersible pump to deliver about 1.5 gpm and develop a pressure at the pump outlet of about 60 psi.). The installation includes the pump, wiring, pipeline in the well, solar panels, frame mounts, inverter, and all appurtenances. Water will be pumped to an existing storage tank at a higher elevation from which it will be used to pressurize the Livestock Pipeline (516) or Irrigation Pipeline (430). Grazing - Livestock exclusion from surface water will result in improved surface water quality and reduced erosion. Grazing has potential to be well distributed. Irrigation: Improved pressure and flow rate will improve irrigation efficiency.

Feature Measure: Pump Power Requirement

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $3,457.78

Scenario Cost/Unit: $3,457.78

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	16	$356.64
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	16	$387.04
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	16	$725.44
Materials						
Pump, <= 5 HP, pump and motor, fixed cost portion	1009	Fixed cost portion of a pump less than or equal to 5 HP pump and motor. This portion is a base cost and is not dependant on horsepower. The total cost of any pump will include this fixed cost plus a variable cost portion. The completed pump and motor will include the motor and controls. Includes material and shipping only.	Each	$1,019.47	1	$1,019.47
Pump, <= 5 HP, pump and motor, variable cost portion	1010	Variable cost portion of a pump less than or equal to 5 HP pump and motor. This portion IS dependent on the total horsepower for the pump. The total cost of any pump will include this variable cost plus the fixed cost portion. The completed pump and motor will include the motor and controls. Includes material and shipping only.	Horsepower	$353.92	0.25	$88.48
Solar Panels, fixed cost portion	1031	Fixed cost portion of the Solar Panels. This portion is a base cost for all Solar Panels and is not dependant on KiloWatt. The total cost of any Solar Panels will include this fixed cost plus a variable cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drops and etc). This cost will include material, labor and equipment.	Each	$273.31	1	$273.31
Solar Panels, variable cost portion	1135	Variable cost portion of the Solar Panels. This portion IS dependent on the total Kilowatt for the Solar Panels. The total cost of any Solar Panels will include this variable cost plus the fixed cost portion. The completed Solar Panels will include all materials (electrical, controllers, and service drop, etc). This cost will include material, labor and equipment.	Kilowatt	$2,429.59	0.25	$607.40

Practice: 533 - Pumping Plant

Scenario: #58 - Photovoltaic Pump 250-1000 Watts

Scenario Description:

The typical scenario assumes installation of a submersible solar-powered pump in a well or a live stream. The installation includes the pump, wiring, drop pipe, solar panels, mounts, inverter, and all appurtenances. Note: It is generally not advisable to use a storage battery for a number of reasons. A storage tank is generally the most efficient method to store energy. Grazing - Livestock exclusion from surface water will result in improved surface water quality and reduced erosion. Irrigation - energy consumption will be reduced and the increased pressure and flow rates will improve irrigation efficiency. Resource Concerns: Insufficient stockwater. Associated Practices include: 374 - Farmstead Energy Improvement; 382 - Fence; 430 - Irrigation Pipeline; 436 - Irrigation Reservoir; 516 - Livestock Pipeline; 561 - Heavy Use Area Protection; and, 614 - Watering Facility.

Before Situation:

Livestock: Inadequate supply or location of water for a prescribed grazing system. Eroded stream banks and degraded water quality due to livestock access to stream. Cattle are not well-distributed because of remote water location. Irrigation: Pressure and flow rate is insufficient for uniform irrigation.

After Situation:

The typical scenario assumes installation of approximately 500 watts of photovoltaic (PV) panels, capable of operating a 1/2 Hp (0.5 Hp) solar-powered submersible pump in a well or other water source (Notes: 1) A PV panel is rated under standard and ideal conditions which will most likely not be replicated in the field; 2) 1 Hp is defined as 746 watts; 3) It is reasonable to expect a 1/2 Hp solar-powered submersible pump to deliver about 5 gpm and develop a pressure at the pump outlet of about 60 psi.). The installation includes the pump, wiring, pipeline in the well, solar panels, frame mounts, inverter, and all appurtenances. Water will be pumped to an existing storage tank at a higher elevation from which it will be used to pressurize the Livestock Pipeline (516) or Irrigation Pipeline (430). Grazing - Livestock exclusion from surface water will result in improved surface water quality and reduced erosion. Grazing has potential to be well distributed. Irrigation: Improved pressure and flow rate will improve irrigation efficiency.

Feature Measure: Pump Power Requirement

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $4,153.66

Scenario Cost/Unit: $4,153.66

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	16	$356.64
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	16	$387.04
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	16	$725.44
Materials						
Pump, <= 5 HP, pump and motor, fixed cost portion	1009	Fixed cost portion of a pump less than or equal to 5 HP pump and motor. This portion is a base cost and is not dependant on horsepower. The total cost of any pump will include this fixed cost plus a variable cost portion. The completed pump and motor will include the motor and controls. Includes material and shipping only.	Each	$1,019.47	1	$1,019.47
Pump, <= 5 HP, pump and motor, variable cost portion	1010	Variable cost portion of a pump less than or equal to 5 HP pump and motor. This portion IS dependent on the total horsepower for the pump. The total cost of any pump will include this variable cost plus the fixed cost portion. The completed pump and motor will include the motor and controls. Includes material and shipping only.	Horsepower	$353.92	0.5	$176.96
Solar Panels, fixed cost portion	1031	Fixed cost portion of the Solar Panels. This portion is a base cost for all Solar Panels and is not dependant on KiloWatt. The total cost of any Solar Panels will include this fixed cost plus a variable cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drops and etc). This cost will include material, labor and equipment.	Each	$273.31	1	$273.31
Solar Panels, variable cost portion	1135	Variable cost portion of the Solar Panels. This portion IS dependent on the total Kilowatt for the Solar Panels. The total cost of any Solar Panels will include this variable cost plus the fixed cost portion. The completed Solar Panels will include all materials (electrical, controllers, and service drop, etc). This cost will include material, labor and equipment.	Kilowatt	$2,429.59	0.5	$1,214.80

Practice: 533 - Pumping Plant

Scenario: #60 - Photovoltaic Pump Greater than 1000 Watts

Scenario Description:

The typical scenario assumes installation of a submersible solar-powered pump in a well or a live stream. The installation includes the pump, wiring, drop pipe, solar panels, mounts, inverter, and all appurtenances. Note: It is generally not advisable to use a storage battery for a number of reasons. A storage tank is generally the most efficient method to store energy. Grazing - Livestock exclusion from surface water will result in improved surface water quality and reduced erosion. Irrigation - energy consumption will be reduced and the increased pressure and flow rates will improve irrigation efficiency. Resource Concerns: Insufficient stockwater. Associated Practices include: 374 - Farmstead Energy Improvement; 382 - Fence; 430 - Irrigation Pipeline; 436 - Irrigation Reservoir; 516 - Livestock Pipeline; 561 - Heavy Use Area Protection; and, 614 - Watering Facility.

Before Situation:

Livestock: Inadequate supply or location of water for a prescribed grazing system. Eroded stream banks and degraded water quality due to livestock access to stream. Cattle are not well-distributed because of remote water location. Irrigation: Pressure and flow rate is insufficient for uniform irrigation.

After Situation:

The typical scenario assumes installation of approximately 1000 watts of photovoltaic (PV) panels, capable of operating a 3/4 Hp (0.75 Hp) solar-powered submersible pump in a well or other water source (Notes: 1) A PV panel is rated under standard and ideal conditions which will most likely not be replicated in the field; 2) 1 Hp is defined as 746 watts; 3) It is reasonable to expect a 3/4 Hp solar-powered submersible pump to deliver about 5 gpm and develop a pressure at the pump outlet of about 60 psi.). The installation includes the pump, wiring, pipeline in the well, solar panels, frame mounts, inverter, and all appurtenances. Water will be pumped to an existing storage tank at a higher elevation from which it will be used to pressurize the Livestock Pipeline (516) or Irrigation Pipeline (430). Grazing - Livestock exclusion from surface water will result in improved surface water quality and reduced erosion. Grazing has potential to be well distributed. Irrigation: Improved pressure and flow rate will improve irrigation efficiency.

Feature Measure: Pump Power Requirement

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $5,456.93

Scenario Cost/Unit: $5,456.93

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	16	$356.64
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	16	$387.04
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	16	$725.44
Materials						
Pump, <= 5 HP, pump and motor, fixed cost portion	1009	Fixed cost portion of a pump less than or equal to 5 HP pump and motor. This portion is a base cost and is not dependant on horsepower. The total cost of any pump will include this fixed cost plus a variable cost portion. The completed pump and motor will include the motor and controls. Includes material and shipping only.	Each	$1,019.47	1	$1,019.47
Pump, <= 5 HP, pump and motor, variable cost portion	1010	Variable cost portion of a pump less than or equal to 5 HP pump and motor. This portion IS dependent on the total horsepower for the pump. The total cost of any pump will include this variable cost plus the fixed cost portion. The completed pump and motor will include the motor and controls. Includes material and shipping only.	Horsepower	$353.92	0.75	$265.44
Solar Panels, fixed cost portion	1031	Fixed cost portion of the Solar Panels. This portion is a base cost for all Solar Panels and is not dependant on KiloWatt. The total cost of any Solar Panels will include this fixed cost plus a variable cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drops and etc). This cost will include material, labor and equipment.	Each	$273.31	1	$273.31
Solar Panels, variable cost portion	1135	Variable cost portion of the Solar Panels. This portion IS dependent on the total Kilowatt for the Solar Panels. The total cost of any Solar Panels will include this variable cost plus the fixed cost portion. The completed Solar Panels will include all materials (electrical, controllers, and service drop, etc). This cost will include material, labor and equipment.	Kilowatt	$2,429.59	1	$2,429.59

Practice: 548 - Grazing Land Mechanical Treatment

Scenario: #1 - mechanical less than 5 percent slope

Scenario Description:
using heavy modified plow or combinations of equipment that modifies physical soil layer or plant conditions on rangelands.

Before Situation:
Desired Ecological plant community is limited by a plant or soil layer that physically restricts change over a threshold.

After Situation:
Desired Ecological plant community has changed by overcoming the threshold or the seeded vegetaion establishes and sustains its function and ecological processes for the life of the practice.

Feature Measure: area of treatment

Scenario Unit: Acres

Scenario Typical Size: 250.0

Scenario Total Cost: $12,513.40

Scenario Cost/Unit: $50.05

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Grazingland Renovation, Chiseling	2027	Chiseling on existing grazingland including tillage implement, power unit and labor.	Acres	$12.34	250	$3,085.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	40	$9,428.40

Practice: 548 - Grazing Land Mechanical Treatment

Scenario: #2 - Pastureland Mechanical Treatment

Scenario Description:

This also applies to organic operations as well. Chisel plowing or subsoiling will be used to break the restrictive layers that will increase water infiltration,break up sod and thatch on introduced forages. Depth of treatment will be 1" deeper than the restictive layer.

Before Situation:

Forage growth on pastureland is limited by compacted soils layers and /or dense sod with a thatch build up.

After Situation:

Forage growth is increased due to greater rooting depths and water infiltration.

Feature Measure: area of treatmnent

Scenario Unit: Acres

Scenario Typical Size: 50.0

Scenario Total Cost: $1,190.21

Scenario Cost/Unit: $23.80

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Ripper or subsoiler, 16 to 36 inch depth	1235	Deep ripper or subsoiler, (16-36 inches depth) includes tillage implement, power unit and labor.	Acres	$19.09	50	$954.50
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 548 - Grazing Land Mechanical Treatment

Scenario: #3 - mechanical more than 5 percent slope

Scenario Description:
On the contour, using mechanical equipment or combinations of equipment that modifies physical soil layer or plant conditions on rangeland.

Before Situation:
Desired Ecological plant community is limited by a plant or soil layer that physically restricts change over a threshold.

After Situation:
Desired Ecological plant community has changed by overcoming the threshold or the seeded vegetaion establishes and sustains its function and ecological processes for the life of the practice and geomorphology of the site.

Feature Measure: area of treatment

Scenario Unit: Acres

Scenario Typical Size: 25.0

Scenario Total Cost: $1,230.03

Scenario Cost/Unit: $49.20

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Grazingland Renovation, Furrowing	2024	Contour furrowing on existing grazingland including tillage implement, power unit and labor.	Acres	$30.72	25	$768.00
Materials						
Wire flags	1586	Small vinyl flags attached to wire stakes, typically, 36 in. in length, for marking tree rows	Each	$0.12	100	$12.00
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	1	$450.03

Practice: 550 - Range Planting

Scenario: #1 - Native - Aerial Application Only

Scenario Description:

Establishment of a mixture of PREDOMINANTLY NATIVE adapted perennial species on a rangeland unit to improve forage condition, improve wildlife habitat and/or reduce erosion. Seed mix of Predominantly Native species is chosen based on range conditions and availability of seed. Planting by aerial broadcasting.

Before Situation:

Rangeland with existing stand of perennial or annual grasses OR monoculture OR no grasses present where natural reseeding or vegetation enhancement by grazing management alone is unlikely. Resource concerns may include: undesirable plant productivity and health, inadequate feed and forage for livestock, soil erosion and soil quality.

After Situation:

Establishment of PREDOMINANTLY NATIVE adapted perennial vegetation such as grasses, forbs, legumes, shrubs, and trees to improve forage quality and quantity and reduce soil erosion on rangeland, native or naturalized pasture, grazed forest or other suitable location.

Feature Measure: Acres of Range Planting

Scenario Unit: Acres

Scenario Typical Size: 80.0

Scenario Total Cost: $22,548.79

Scenario Cost/Unit: $281.86

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Seeding Operation, Aerial	958	Broadcast seed via aerial operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs.	Acres	$13.35	80	$1,068.00
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$18.46	16	$295.36
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	8	$193.52
Materials						
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$111.33	140	$15,586.20
Native Perennial Grasses, Legumes and/or Forbs, Medium Density	2754	A mix of native perennial grasses, legumes, and/or forbs, grasses typically greater than 50% of the mix, mmay include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to higher density (41-60 pure live seeds/sq ft). Species typically easy to purchase. Includes material and shipping.	Acres	$258.50	20	$5,170.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 550 - Range Planting

Scenario: #2 - Native -Heavy

Scenario Description:

Establishment of a mixture of PREDOMINANTLY NATIVE adapted perennial species on a rangeland unit to improve forage condition, improve wildlife habitat and/or reduce erosion. Seed mix of Predominantly Native species is chosen based on range conditions and availability of seed. Planting by preparing a seedbed with MODERATE TO HEAVY TILLAGE (ex: ripping & heavy disk) and seeding with a no-till drill, range drill, or broadcasting.

Before Situation:

Rangeland with existing stand of perennial or annual grasses OR monoculture OR no grasses present where natural reseeding or vegetation enhancement by grazing management alone is unlikely. Existing conditions often require complete suppression or eradication of existing vegetation to ensure success of planting. Resource concerns may include: undesirable plant productivity and health, inadequate feed and forage for livestock, soil erosion and soil quality.

After Situation:

Establishment of PREDOMINANTLY NATIVE adapted perennial vegetation such as grasses, forbs, legumes, shrubs, and trees to improve forage quality and quantity and reduce soil erosion on rangeland, native or naturalized pasture, grazed forest or other suitable location.

Feature Measure: Acres of Range Planting

Scenario Unit: Acres

Scenario Typical Size: 80.0

Scenario Total Cost: $14,726.69

Scenario Cost/Unit: $184.08

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	80	$791.20
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acres	$15.10	80	$1,208.00
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	80	$1,624.80
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$18.46	16	$295.36
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	8	$193.52
Materials						
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$111.33	70	$7,793.10
Native Perennial Grasses, Legumes and/or Forbs, Medium Density	2754	A mix of native perennial grasses, legumes, and/or forbs, grasses typically greater than 50% of the mix, mmay include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to higher density (41-60 pure live seeds/sq ft). Species typically easy to purchase. Includes material and shipping.	Acres	$258.50	10	$2,585.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 550 - Range Planting

Scenario: #3 - Native -Wildlife or Pollinator

Scenario Description:

Establishment of a mixture of PREDOMINANTLY NATIVE adapted perennial species on a rangeland unit to improve wildlife habitat, benefit pollinators & beneficial insects, improve forage condition, and/or reduce erosion. Seed mix of PREDOMINANTLY NATIVE SPECIES IS CHOSEN TO SPECIFICALLY BENEFIT WILDLIFE (ex: big game spp, Sage grouse, Lesser Prairie Chicken, others) or POLLINATORS (ex: inclusion of 5-10 forb species) based on range conditions and availability of seed. FOR POLLINATOR HABITAT: Consideration is given to selecting plants that bloom sequentially throughout the growing season where feasible. Planting by preparing a seedbed with MODERATE TO HEAVY TILLAGE (ex: ripping & heavy disk) and seeding with a no-till drill, range drill, or broadcasting.

Before Situation:

Rangeland with existing stand of perennial or annual grasses OR monoculture OR no grasses present where natural reseeding or vegetation enhancement by grazing management alone is unlikely. Existing conditions often require complete removal, suppression, or eradication of existing vegetation to ensure success of planting. Pollinator plantings Resource Concerns may include: inadequate habitat for wildlife (ex: big game spp, Sage grouse, Lesser Prairie Chicken, others) undesirable plant productivity and health, inadequate feed and forage for livestock, soil erosion and soil quality.

After Situation:

Establishment of PREDOMINANTLY NATIVE adapted perennial vegetation such as grasses, forbs, legumes, shrubs, and trees with an emphasis on species beneficial to wildlife or Pollinators on rangeland, native or naturalized pasture, grazed forest or other suitable location. For Pollinator habitat: Plants that bloom sequentially throughout the growing season are established, where feasible.

Feature Measure: Acres of Range Planting

Scenario Unit: Acres

Scenario Typical Size: 50.0

Scenario Total Cost: $5,091.73

Scenario Cost/Unit: $101.83

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	50	$494.50
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acres	$15.10	50	$755.00
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	50	$1,015.50
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	8	$193.52
Materials						
Annual Grasses, Legumes or Forbs	2732	A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$47.95	50	$2,397.50
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 550 - Range Planting

Scenario: #4 - Non-Native - Aerial Application Only

Scenario Description:

Establishment of a mixture of PREDOMINANTLY NON-NATIVE adapted perennial species on a rangeland unit to improve forage condition, improve wildlife habitat and/or reduce erosion. Seed mix of Predominantly Non-Native species is chosen based on range conditions and availability of seed. Planting by aerial broadcasting.

Before Situation:

Rangeland with existing stand of perennial or annual grasses OR monoculture OR no grasses present where natural reseeding or vegetation enhancement by grazing management alone is unlikely. Resource concerns may include: undesirable plant productivity and health, inadequate feed and forage for livestock, soil erosion and soil quality.

After Situation:

Establishment of PREDOMINANTLY NON-NATIVE adapted perennial vegetation such as grasses, forbs, legumes, shrubs, and trees to improve forage quality and quantity and reduce soil erosion on rangeland, native or naturalized pasture, grazed forest or other suitable location.

Feature Measure: Acres of Range Planting

Scenario Unit: Acres

Scenario Typical Size: 80.0

Scenario Total Cost: $8,566.59

Scenario Cost/Unit: $107.08

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Seeding Operation, Aerial	958	Broadcast seed via aerial operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs.	Acres	$13.35	80	$1,068.00
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$18.46	16	$295.36
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	8	$193.52
Materials						
Introduced Perennial Grasses, Legumes and/or Forbs, Low Density	2747	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$30.75	140	$4,305.00
Native and Introduced Perennial Grasses, Legumes and/or Forbs, Medium Density	2756	A mix of native and introduced perennial grasses, legumes, and/or forbs, grasses typically greater than 50% of the mix, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to high density (41-60 pure live seeds/sq ft). Includes material and shipping.	Acres	$123.45	20	$2,469.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 550 - Range Planting

Scenario: #5 - Non-Native - heavy prep

Scenario Description:

Establishment of a mixture of PREDOMINANTLY NON-NATIVE adapted perennial species on a rangeland unit to improve forage condition, improve wildlife habitat and/or reduce erosion. Seed mix of Predominantly Native species is chosen based on range conditions and availability of seed. Planting by preparing a seedbed with MODERATE TO HEAVY TILLAGE (ex: ripping & heavy disk) and seeding with a no-till drill, range drill, or broadcasting.

Before Situation:

Rangeland with existing stand of perennial or annual grasses OR monoculture OR no grasses present where natural reseeding or vegetation enhancement by grazing management alone is unlikely. Existing conditions often require complete suppression or eradication of existing vegetation to ensure success of planting. Resource concerns may include: undesireable plant productivity and health, inadequate feed and forage for livestock, soil erosion and soil quality.

After Situation:

Establishment of PREDOMINANTLY NON-NATIVE adapted perennial vegetation such as grasses, forbs, legumes, shrubs, and trees to improve forage quality and quantity and reduce soil erosion on rangeland, native or naturalized pasture, grazed forest or other suitable location.

Feature Measure: Acres of Range Planting

Scenario Unit: Acres

Scenario Typical Size: 80.0

Scenario Total Cost: $7,550.19

Scenario Cost/Unit: $94.38

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	80	$791.20
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acres	$15.10	80	$1,208.00
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	80	$1,624.80
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$18.46	16	$295.36
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	8	$193.52
Materials						
Introduced Perennial Grasses, Legumes and/or Forbs, Low Density	2747	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$30.75	72	$2,214.00
Native and Introduced Perennial Grasses, Legumes and/or Forbs, Medium Density	2756	A mix of native and introduced perennial grasses, legumes, and/or forbs, grasses typically greater than 50% of the mix, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to high density (41-60 pure live seeds/sq ft). Includes material and shipping.	Acres	$123.45	8	$987.60
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 550 - Range Planting

Scenario: #6 - Pollinator - small acreage

Scenario Description:

Establishment of a mixture of PREDOMINANTLY NATIVE adapted perennial species on a rangeland unit to benefit pollinators, beneficial insects, and may provide food and cover resources for other wildlife species. Seed mix of Predominantly Native species is chosen TO SPECIFICALLY BENEFIT POLLINATORS (ex: inclusion of 5-10 forb species) based on range conditions and availability of seed. Consideration is given to selecting plants that bloom sequentially throughout the growing season where feasible. Planting by preparing a seedbed with MODERATE TO HEAVY TILLAGE (ex: ripping & heavy disk) and seeding with a no-till drill, range drill, or broadcasting.

Before Situation:

Rangeland with existing stand of perennial or annual grasses OR monoculture OR no grasses present where natural reseeding or vegetation enhancement by grazing management alone is unlikely. Existing conditions often require complete removal, suppression, or eradication of existing vegetation to ensure success of planting. Resource concerns may include: inadequate Pollinator habitat, undesireable plant productivity and health, inadequate feed and forage for livestock, soil erosion and soil quality.

After Situation:

Establishment of PREDOMINANTLY NATIVE adapted perennial vegetation such as grasses, forbs, legumes, shrubs, and trees with an emphasis on species beneficial to Pollinators & beneficial insects on rangeland, native or naturalized pasture, grazed forest or other suitable location. Plants that bloom sequentially throughout the growing season are established, where feasible.

Feature Measure: Acres of Range Planting

Scenario Unit: Acres

Scenario Typical Size: 5.0

Scenario Total Cost: $1,653.23

Scenario Cost/Unit: $330.65

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	5	$49.45
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acres	$15.10	5	$75.50
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	5	$101.55
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	3	$72.57
Materials						
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$111.33	2.5	$278.33
Native Perennial Grasses, Legumes and/or Forbs, High Density	2755	A mix of native perennial grasses, legumes, and/or forbs, grasses typically greater than 50% of the mix, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Species typically easy to purchase. Includes material and shipping.	Acres	$336.05	2.5	$840.13
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 550 - Range Planting

Scenario: #62 - Native -Standard prep

Scenario Description:

Establishment of a mixture of PREDOMINANTLY NATIVE adapted perennial species on a rangeland unit to improve forage condition, improve wildlife habitat and/or reduce erosion. Seed mix of Predominantly Native species is chosen based on range conditions and availability of seed. Planting by preparing a seedbed with a LIGHT TO MODERATE TILLAGE and seeding with a no-till drill, range drill, or broadcasting.

Before Situation:

Rangeland with existing stand of perennial or annual grasses OR monoculture OR no grasses present where natural reseeding or vegetation enhancement by grazing management alone is unlikely. Resource concerns may include: undesirable plant productivity and health, inadequate feed and forage for livestock, soil erosion and soil quality.

After Situation:

Establishment of PREDOMINANTLY NATIVE adapted perennial vegetation such as grasses, forbs, legumes, shrubs, and trees to improve forage quality and quantity and reduce soil erosion on rangeland, native or naturalized pasture, grazed forest or other suitable location.

Feature Measure: Acres of Range Planting

Scenario Unit: Acres

Scenario Typical Size: 80.0

Scenario Total Cost: $12,743.19

Scenario Cost/Unit: $159.29

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	80	$791.20
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	80	$1,624.80
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$18.46	16	$295.36
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	8	$193.52
Materials						
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$111.33	70	$7,793.10
Native Perennial Grasses, Legumes and/or Forbs, Low Density	2753	A mix of native perennial grasses, legumes, and/or forbs, grasses typically greater than 50% of the mix, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Species typically easy to purchase. Includes material and shipping.	Acres	$180.95	10	$1,809.50
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 550 - Range Planting

Scenario: #63 - Non-Native - Standard prep

Scenario Description:

Establishment of a mixture of PREDOMINANTLY NON-NATIVE adapted perennial species on a rangeland unit to improve forage condition, improve wildlife habitat and/or reduce erosion. Seed mix of Predominantly Non-Native species is chosen based on range conditions and availability of seed. Planting by preparing a seedbed with a LIGHT TO MODERATE tillage and seeding with a no-till drill, range drill, or broadcasting.

Before Situation:

Rangeland with existing stand of perennial or annual grasses OR monoculture OR no grasses present where natural reseeding or vegetation enhancement by grazing management alone is unlikely. Resource concerns may include: undesirable plant productivity and health, inadequate feed and forage for livestock, soil erosion and soil quality.

After Situation:

Establishment of PREDOMINANTLY NON-NATIVE adapted perennial vegetation such as grasses, forbs, legumes, shrubs, and trees to improve forage quality and quantity and reduce soil erosion on rangeland, native or naturalized pasture, grazed forest or other suitable location.

Feature Measure: Acres of Range Planting

Scenario Unit: Acres

Scenario Typical Size: 80.0

Scenario Total Cost: $5,986.75

Scenario Cost/Unit: $74.83

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	80	$791.20
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	80	$1,624.80
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$18.46	16	$295.36
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	8	$193.52
Materials						
Native and Introduced Perennial Grasses, Legumes and/or Forbs, Low Density	2502	A mix of native and introduced perennial grasses, legumes, and/or forbs, grasses typically greater than 50% of the mix, may include biennials and a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$79.02	8	$632.16
Introduced Perennial Grasses, Legumes and/or Forbs, Low Density	2747	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$30.75	72	$2,214.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 550 - Range Planting

Scenario: #66 - Native perennial, Conversion from Dryland cropland, w/FI

Scenario Description:

Establishment of a mixture of PREDOMINANTLY NATIVE adapted perennial species on a rangeland unit to improve forage condition, improve wildlife habitat and/or reduce erosion. Seed mix of Predominantly Native species is chosen based on range conditions and availability of seed. Planting by preparing a seedbed with a LIGHT TO MODERATE TILLAGE and seeding with a no-till drill, range drill, or broadcasting. This scenario includes foregone income when land is converted from DRYLAND cropland.

Before Situation:

A monoculture of DRYLAND crops are grown on cropland. The resource concerns include soil erosion, soil quality degradation, and inadequate habitat for fish and wildlife.

After Situation:

Establishment of PREDOMINANTLY NATIVE adapted perennial vegetation such as grasses, forbs, legumes, shrubs, and trees is established to protect soil from erosion, increase carbon sequestration and improve soil health, provide habitat for pollinators and other wildlife, and provide adequate forage for livestock.

Feature Measure: Acres of Range planting

Scenario Unit: Acres

Scenario Typical Size: 80.0

Scenario Total Cost: $28,988.43

Scenario Cost/Unit: $362.36

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	80	$791.20
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	80	$1,624.80
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$215.46	80	$17,236.80
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	8	$193.52
Materials						
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$111.33	80	$8,906.40
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 554 - Drainage Water Management

Scenario: #1 - Drainage Water Management (DWM)

Scenario Description:

This scenario is the process of managing water discharges from surface and/or subsurface agricultural drainage systems by reducing nutrient loading into surface waters. Typical systems consist of a 75 acre field with existing drainage tile lines and installed water control structures. The operator goes to the field in order to adjust water control structures (riser boards). While on site the date and adjustment information is recorded/logged. The number of yearly adjustments is based on 6 trips to a field 5 miles from headquarters. The field time to make and record each adjustment is 0.5 hours per structure (including travel time). The typical field will contain 5 water control structures; 3 structures control field water levels and 2 structures control a single denitrifying bioreactor. Resource Concern: Water Quality - Excess Nutrients in surface and ground waters. Associated Practices: 606-Subsurface Drain; 607-Surface Drain, Field Ditch; 608-Surface Drain, Main or Lateral; 587-Structure for Water Control; 590-Nutrient Management .

Before Situation:

Existing drainage systems are in place and water flows uncontrolled.

After Situation:

Existing drainage systems are managed to reduce flow of field drainage waters from the site and reduce nitrate loading by denitrification.

Feature Measure: Number of Control Structures

Scenario Unit: Each

Scenario Typical Size: 5.0

Scenario Total Cost: $547.85

Scenario Cost/Unit: $109.57

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$109.25	0.33	$36.05
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	15	$511.80

Practice: 555 - Rock Wall Terrace

Scenario: #7 - Rock/Geotextile/Gravel Barrier

Scenario Description:

A rock retaining wall with rock riprap on geotextile and gravel bedding constructed across the slope to form and support a bench terrace that will control the flow of water and check erosion on sloping land. The rock retaining wall will stabilize steeply sloping land so that it can be farmed with minimal soil loss. The resource concerns addressed include soil erosion, water quality degradation, and excess water.

Before Situation:

Rock barriers are applicable to agricultural land that is steeply sloping with a soil depth adequate for benching and where the effectiveness of less intensive measures for soil and water conservation are inadequate. This standard applies to sites with land slopes up to 70 percent. Suitable, stable natural outlets or satisfactory sites for constructed outlets must be available.

After Situation:

A rock barrier, approximately 200 feet in length, with 90 cubic yards of rock, with a gravel bedding of approximately 26 cubic yards on geotextile, constructed across the slope to form and support a bench terrace that will control the flow of water and check erosion on sloping land to stabilize steeply sloping land so that it can be farmed with minimal soil loss. Vegetation of disturbed areas will be completed under critical area planting (342). Erosion control during construction activities will use Stormwater Runoff Control (570). Other associated practices include Terrace (600), Grassed Waterway (412), and Underground Outlet (620).

Feature Measure: Feet of Rock Barrier

Scenario Unit: Feet

Scenario Typical Size: 200.0

Scenario Total Cost: $8,623.73

Scenario Cost/Unit: $43.12

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Stripping and stockpiling, topsoil	1199	Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor.	Cubic Yards	$0.87	20	$17.40
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic Yards	$84.32	90	$7,588.80
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	26	$781.82
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 555 - Rock Wall Terrace

Scenario: #8 - Grouted Rock Geotextile Gravel Barrier

Scenario Description:

A rock retaining wall with grouted rock riprap on geotextile and gravel bedding constructed across the slope to form and support a bench terrace that will control the flow of water and check erosion on sloping land. The rock retaining wall will stabilize steeply sloping land so that it can be farmed with minimal soil loss. The resource concerns addressed include soil erosion, water quality degradation, and excess water.

Before Situation:

Rock barriers are applicable to agricultural land that is steeply sloping with a soil depth adequate for benching and where the effectiveness of less intensive measures for soil and water conservation are inadequate. This standard applies to sites with land slopes up to 70 percent. Suitable, stable natural outlets or satisfactory sites for constructed outlets must be available.

After Situation:

A rock barrier, approximately 200 feet in length, with 90 cubic yards of grouted rock, with a gravel bedding of approximately 12 cubic yards with approximately 230 square yards of geotextile, constructed across the slope to form and support a bench terrace that will control the flow of water and check erosion on sloping land to stabilize steeply sloping land so that it can be farmed with minimal soil loss. Vegetation of disturbed areas will be completed under critical area planting (342). Erosion control during construction activities will use Stormwater Runoff Control (570). Other associated practices include Terrace (600), Grassed Waterway (412), and Underground Outlet (620).

Feature Measure: Feet of Rock Barrier

Scenario Unit: Feet

Scenario Typical Size: 200.0

Scenario Total Cost: $13,147.29

Scenario Cost/Unit: $65.74

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Stripping and stockpiling, topsoil	1199	Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor.	Cubic Yards	$0.87	20	$17.40
Scraper, self propelled, 21 CY	1208	Self propelled earthmoving scraper with 21 CY capacity. Does not include labor.	Hours	$333.12	5	$1,665.60
Rock Riprap, grouted	1757	Grouted Rock Riprap, placed, includes materials, equipment and labor to transport and place.	Cubic Yards	$114.69	90	$10,322.10
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	6	$201.84
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	26	$781.82
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53

Practice: 555 - Rock Wall Terrace

Scenario: #9 - Gabion Rock Barrier

Scenario Description:

A rock retaining wall with rock filled gabions on geotextile and gravel bedding constructed across the slope to form and support a bench terrace that will control the flow of water and check erosion on sloping land. The rock retaining wall will stabilize steeply sloping land so that it can be farmed with minimal soil loss. The resource concerns addressed include soil erosion, water quality degradation, and excess water.

Before Situation:

Rock barriers are applicable to agricultural land that is steeply sloping with a soil depth adequate for benching and where the effectiveness of less intensive measures for soil and water conservation are inadequate. This standard applies to sites with land slopes up to 70 percent. Suitable, stable natural outlets or satisfactory sites for constructed outlets must be available.

After Situation:

A rock barrier, approximately 200 feet in length, with 90 cubic yards of rock in gabions, with a gravel bedding of approximately 12 cubic yards with approximately 230 square yards of geotextile, constructed across the slope to form and support a bench terrace that will control the flow of water and check erosion on sloping land to stabilize steeply sloping land so that it can be farmed with minimal soil loss. Vegetation of disturbed areas will be completed under critical area planting (342). Erosion control during construction activities will use Stormwater Runoff Control (570). Other associated practices include Terrace (600), Grassed Waterway (412), and Underground Outlet (620).

Feature Measure: Feet of Rock Barrier

Scenario Unit: Feet

Scenario Typical Size: 200.0

Scenario Total Cost: $14,415.75

Scenario Cost/Unit: $72.08

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Stripping and stockpiling, topsoil	1199	Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor.	Cubic Yards	$0.87	20	$17.40
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	6	$204.72
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	26	$781.82
Geotextile, non-woven, light weight	1209	Non-woven less than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only.	Square Yard	$1.64	230	$377.20
Gabion basket or mat	1378	Gabion baskets or mats installed and filled on grade, includes materials, transport, equipment, and labor, does not include geotextile fabric.	Cubic Yards	$142.21	90	$12,798.90
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 558 - Roof Runoff Structure

Scenario: #1 - Roof Gutter, Small, 6 inches wide and smaller

Scenario Description:

A small roof runoff structure, consisting of gutter(s) equal to or less than 6" wide, downspout(s) 5 inches wide or less, and appropriate outlet facilities. Used to keep roof clean water runoff uncontaminated and provide a stable outlet to ground surface. Facilitates waste management and protects environment by minimizing clean water additions to waste systems and addresses water quality concerns. Associated practices include Waste Storage Facility (313), Composting Facility (317), Heavy Use Area Protection (561), Watering Facility (614), Underground Outlet (620), Diversion (362), and any relevant irrigation practices.

Before Situation:

Applicable where: (1) a roof runoff management facility is included in an overall plan for an overall plan for a waste management system; (2) roof runoff needs to be diverted away from structures or contaminated areas; (3) there is a need to collect, control, and transport runoff from roofs to a stable outlet.

After Situation:

A small gutter, downspout, and outlet system servicing the portion of the building roof that would otherwise drain into a waste management system or create erosion. Roof line of 200 ft serviced with gutter, downspouts, and appurtances.

Feature Measure: Linear Length of Roof to be Guttere

Scenario Unit: Feet

Scenario Typical Size: 100.0

Scenario Total Cost: $1,226.50

Scenario Cost/Unit: $12.27

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	16	$387.04
Materials						
Pipe, HDPE, 4 in., PCPT, Single Wall	1270	Pipe, Corrugated Plastic Tubing, Single Wall, Perforated, 4 inch diameter - ASTM F405. Material cost only.	Feet	$0.52	40	$20.80
Gutter, Aluminum, Small	1689	Aluminum gutter (4" to 6") in width with hangers. Materials only.	Feet	$3.48	100	$348.00
Downspout, Aluminum	1700	Aluminum downspout 3 to 5 inch width with hangers. Materials only.	Feet	$2.56	60	$153.60
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	2	$317.06

Practice: 558 - Roof Runoff Structure

Scenario: #2 - Roof Gutter, Medium, 7 to 9 inches wide

Scenario Description:

A roof runoff structure, consisting of gutter(s), downspout(s), and appropriate outlet facilities. Used to keep roof clean water runoff uncontaminated and provide a stable outlet to ground surface. Facilitates waste management and protects environment by minimizing clean water additions to waste systems and addresses water quality concerns. Associated practices include Waste Storage Facility (313), Composting Facility (317), Heavy Use Area Protection (561), Watering Facility (614), Underground Outlet (620), Diversion (362), and any relevant irrigation practices.

Before Situation:

Applicable where: (1) a roof runoff management facility is included in an overall plan for an overall plan for a waste management system; (2) roof runoff needs to be diverted away from structures or contaminated areas; (3) there is a need to collect, control, and transport runoff from roofs to a stable outlet.

After Situation:

A gutter, downspout, and outlet system servicing the portion of the building roof that would otherwise drain into a waste management system or create erosion. Roof line of 200 ft serviced with gutter, downspouts, and appurtances.

Feature Measure: Linear Length of Roof to be Guttere

Scenario Unit: Feet

Scenario Typical Size: 200.0

Scenario Total Cost: $2,702.37

Scenario Cost/Unit: $13.51

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	16	$387.04
Materials						
Pipe, HDPE, 4 in., PCPT, Single Wall	1270	Pipe, Corrugated Plastic Tubing, Single Wall, Perforated, 4 inch diameter - ASTM F405. Material cost only.	Feet	$0.52	50	$26.00
Gutter, Aluminum, Medium	1690	Aluminum gutter (7" to 9") in width with hangers. Materials only.	Feet	$9.63	200	$1,926.00
Downspout, Aluminum	1700	Aluminum downspout 3 to 5 inch width with hangers. Materials only.	Feet	$2.56	80	$204.80
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53

Practice: 558 - Roof Runoff Structure

Scenario: #3 - Roof Gutter with Fascia

Scenario Description:

Existing roof does not have adequate fascia material to support the required roof gutter for a roof runoff structure. Practice installation requires a fascia board, gutter(s), downspout(s), and appropriate outlet facilities. Used to keep roof clean water runoff uncontaminated and provide a stable outlet to ground surface. Facilitates waste management and protects environment by minimizing clean water additions to waste systems and addresses water quality concerns. Associated practices include Waste Storage Facility (313), Composting Facility (317), Heavy Use Area Protection (561), Watering Facility (614), Underground Outlet (620), Diversion (362), and any relevant irrigation practices.

Before Situation:

Applicable where: (1) a roof runoff management facility is included in an overall plan for an overall plan for a waste management system; (2) roof runoff needs to be diverted away from structures or contaminated areas; (3) there is a need to collect, control, and transport runoff from roofs to a stable outlet.

After Situation:

A gutter, downspout, and outlet system servicing the portion of the building roof that would otherwise drain into a waste management system or create erosion. Roof line of 200 ft serviced with gutter, four downspouts, and appurtances. New 2" x 8" fascia board needed for proper attachment.

Feature Measure: Linear Length of Roof to be Guttere

Scenario Unit: Feet

Scenario Typical Size: 200.0

Scenario Total Cost: $3,732.88

Scenario Cost/Unit: $18.66

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	32	$774.08
Materials						
Pipe, HDPE, 4 in., PCPT, Single Wall	1270	Pipe, Corrugated Plastic Tubing, Single Wall, Perforated, 4 inch diameter - ASTM F405. Material cost only.	Feet	$0.52	50	$26.00
Dimension Lumber, untreated, rot resistant	1613	Untreated dimension lumber with nominal thickness equal or less than 2" milled from a rot resistant species such as cedar. Includes lumber and fasteners. Does not include labor.	Board Feet	$2.41	267	$643.47
Gutter, Aluminum, Medium	1690	Aluminum gutter (7" to 9") in width with hangers. Materials only.	Feet	$9.63	200	$1,926.00
Downspout, Aluminum	1700	Aluminum downspout 3 to 5 inch width with hangers. Materials only.	Feet	$2.56	80	$204.80
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53

Practice: 558 - Roof Runoff Structure

Scenario: #4 - Roof Gutter, 6 inches wide with runoff Storage Tank

Scenario Description:

A roof runoff structure, consisting of gutter(s), downspout(s), and a storage tank. Used to keep roof clean water runoff uncontaminated, provide storage for on-farm use of roof water and a stable outlet for any excess to ground surface in a way that avoids erosion. Facilitates waste management and protects environment by minimizing clean water additions to waste systems and addresses water quality concerns. Associated practices include Waste Storage Facility (313), Composting Facility (317), Heavy Use Area Protection (561), Watering Facility (614), Underground Outlet (620), Diversion (362), and any relevant irrigation practices.

Before Situation:

Applicable where: (1) a roof runoff management facility is included in an overall plan for an overall plan for a waste management system; (2) roof runoff needs to be diverted away from structures or contaminated areas; (3) there is a need to collect, control, and transport runoff from roofs to a stable outlet.

After Situation:

A gutter and downspouts servicing the portion of the building roof that would otherwise drain into a waste management system or create erosion. Roof line of 200 ln.ft. serviced with gutter, downspouts, and appurtances. A 1,500 gallon tank is installed for storage and use of roof runoff.

Feature Measure: Linear Length of Roof to be Guttere

Scenario Unit: Feet

Scenario Typical Size: 200.0

Scenario Total Cost: $3,237.39

Scenario Cost/Unit: $16.19

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$5.40	2	$10.80
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	1	$34.12
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	20	$483.80
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	2	$60.14
Pipe, PVC, 4 in., SCH 40	978	Materials: - 4 inch - PVC - SCH 40 - ASTM D1785	Feet	$3.74	110	$411.40
Tank, Poly Enclosed Storage, >1,000	1075	Water storage tanks. Includes materials and shipping only.	Gallons	$0.80	1500	$1,200.00
Gutter, Aluminum, Small	1689	Aluminum gutter (4" to 6") in width with hangers. Materials only.	Feet	$3.48	200	$696.00
Downspout, Aluminum	1700	Aluminum downspout 3 to 5 inch width with hangers. Materials only.	Feet	$2.56	60	$153.60
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53
Aggregate, Shipping, Cubic Yard-mile	2360	Mobilization of aggregate material beyond 20 miles of local delivery from quarry to construction site. Cubic Yard-mile (Cubic Yard * miles of haul).	Cubic Yard Mile	$0.29	100	$29.00

Practice: 558 - Roof Runoff Structure

Scenario: #5 - Concrete Curb

Scenario Description:

A roof runoff structure, consisting of a concrete curb or parabolic channel installed on existing impervious surface or the ground with appropriate outlet facilities. Environmental/design considerations, for example – snow loads, or a building without proper structural support needed for gutters dictate the use of an on-ground concrete curb. Used to keep roof clean water runoff uncontaminated and provide a stable outlet to ground surface. Facilitates waste management and protects the environment by minimizing clean water additions to waste systems and addresses water quality concerns. Associated practices include Waste Storage Facility (313), Composting Facility (317), Heavy Use Area Protection (561), Underground Outlet (620), and Diversion (362).

Before Situation:

Applicable where: (1) a roof runoff management facility is included in an overall plan for an overall plan for a waste management system; (2) roof runoff needs to be diverted away from structures or contaminated areas; (3) there is a need to collect, control, and transport runoff from roofs to a stable outlet.

After Situation:

A concrete curb or parabolic channel and outlet system servicing the portion of the building roof that would otherwise drain into a waste management system or create erosion. Concrete curb (6" high - 2' wide) extending the length of a 200' roof with additional length (5') for stable outlet.

Feature Measure: Linear Length of Roof to be Curbed

Scenario Unit: Feet

Scenario Typical Size: 200.0

Scenario Total Cost: $2,899.39

Scenario Cost/Unit: $14.50

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formless, non reinforced	36	Non reinforced concrete cast-in-placed without forms by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$184.90	10	$1,849.00
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.37	16	$21.92
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	30	$62.40
Demolition, concrete	1498	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yards	$11.03	6	$66.18
Hauling, bulk, highway truck	1615	Hauling of bulk earthfill, rockfill, waste or debris. One-way travel distance using fully loaded highway dump trucks (typically 16 CY or 20 TN capacity). Includes equipment and labor for truck only. Does not include cost for loading truck.	Cubic Yard Mile	$0.28	60	$16.80
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic Yards	$28.74	7	$201.18
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	7	$210.49
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 558 - Roof Runoff Structure

Scenario: #6 - Trench Drain

Scenario Description:

A roof runoff structure, consisting of a trench filled with rock, with a polyethylene, corrugated, perforated drain tile installed in trench bottom. Used to keep roof clean water runoff uncontaminated and provide a stable outlet to ground surface. Environmental/design considerations, for example – snow loads, or a building without proper structural support needed for gutters dictate the use of a trench drain. Facilitates waste management and protects the environment by minimizing clean water additions to waste systems and addresses water quality concerns. Associated practices include Waste Storage Facility (313), Composting Facility (317), Heavy Use Area Protection (561), Underground Outlet (620), and Diversion (362).

Before Situation:

Applicable where: (1) a roof runoff management facility is included in an overall plan for an overall plan for a waste management system; (2) roof runoff needs to be diverted away from structures or contaminated areas; (3) there is a need to collect, control, and transport runoff from roofs to a stable outlet.

After Situation:

A 2' deep by 3' wide by 200 long deep rock filled, tile drained trench and outlet system servicing the portion of the building roof that would otherwise drain into a waste management system or create erosion.

Feature Measure: Linear Length of Roof to be Drained

Scenario Unit: Feet

Scenario Typical Size: 200.0

Scenario Total Cost: $2,295.34

Scenario Cost/Unit: $11.48

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.37	222	$304.14
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	44	$91.52
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	6	$145.14
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	44	$1,323.08
Pipe, HDPE, 4 in., PCPT, Single Wall	1270	Pipe, Corrugated Plastic Tubing, Single Wall, Perforated, 4 inch diameter - ASTM F405. Material cost only.	Feet	$0.52	220	$114.40
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	2	$317.06

Practice: 560 - Access Road

Scenario: #1 - New earth road in dry, level terrain.

Scenario Description:

Newly constructed compacted earth road in relatively level terrain and dry areas. A properly constructed, well defined access road will address resource concerns related with compaction, emissions of fugitive dust, and excessive sediment in surface water. It also improves the plant productivity, vigor and health and substantially reduces the chance of wild fire hazards. Short term air quality deterioration may result if proper dust control measures are not implemented during the practice installation. Costs include excavation, shaping, grading, surface material, vegetation of disturbed areas and all equipment, labor and incidental materials necessary to install the practice.

Before Situation:

An agricultural enterprise which requires, but does not have, a fixed travelway for equipment and vehicles for various resource activities and where use of equipment and vehicles within the enterprise without a defined access road would result in compaction, excessive sediment and turbidity in surface water, reduced visibility, and emissions of fugitive dust. This scenario is applicable where the resource activity areas consist of relatively dry and level terrain lands.

After Situation:

The road will be 14 feet wide at the top, mostly in embankment less than 3 feet in height, (average 2 ft) typical side slopes 2:1. A properly constructed, well defined access road will greatly reduce or eliminate compaction in land use areas where it is harmful, reduce emissions of fugitive dust and also reduce excessive sediment in surface water by reducing uncontrolled sediment transport and improving drainage of irrigated lands. Planned grades will include all dips and water bars. If clearing and grubbing of land in the alignment area is required, use Land Clearing (460). Pipe culverts installed as part of access road should be covered by either Structures for Water Control (587) or Stream Crossings (578) depending on the type of structure. Earthfill embankment above the culvert structure would still be covered by this Practice. Diversions constructed as part of access road should be covered by Diversion (362). All seeding or revegetation of disturbed areas is provided according to Critical Area Planting (342). Dust control must be addressed under Dust Control on Unpaved Roads and Surfaces (373).

Feature Measure: Length of Roadway

Scenario Unit: Feet

Scenario Typical Size: 1,000.0

Scenario Total Cost: $10,782.04

Scenario Cost/Unit: $10.78

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	1330	$5,572.70
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.42	1330	$4,548.60
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	12	$409.44
Materials						
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$111.33	0.14	$15.59
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 560 - Access Road

Scenario: #2 - New 6 inch gravel road in wet, level terrain

Scenario Description:

Newly Constructed gravel road with min. 6 inch thick compacted gravel surface in relatively level ground in wet areas. A properly constructed, well defined access road will address resource concerns related with compaction, emissions of fugitive dust, and excessive sediment in surface water. It also improves the plant productivity, vigor and health and substantially reduces the chance of wild fire hazards. Short term air quality deterioration may result if proper dust control measures are not implemented during the practice installation. Costs include excavation, shaping, grading, surface material, vegetation of disturbed areas and all equipment, labor and incidental materials necessary to install the practice.

Before Situation:

An agricultural enterprise which requires, but does not have, a fixed travel way for equipment and vehicles for various resource activities and where use of equipment and vehicles within the enterprise without a defined access road would result in compaction, excessive sediment and turbidity in surface water, reduced visibility, and emissions of fugitive dust. This scenario is applicable where the resource activity areas consist of relatively wet and swampy but level terrain lands.

After Situation:

The road will be 14 feet wide with 6 inch gravel surfacing at the top. It is mostly in embankment less than 3 feet in height, (average 2 ft) typical side slopes 2:1. A properly constructed, well defined access road will greatly reduce sheet, rill and wind erosion, eliminate compaction in land use areas where it is harmful, reduce emissions of particulate matter (PM) and PM precursors and also reduce excessive sediment in surface water by reducing uncontrolled sediment transport. Planned grades will include all dips and water bars. If clearing and grubbing of land in the alignment area is required, use Land Clearing (460). Pipe culverts installed as part of access road should be covered by either Structures for Water Control (587) or Stream Crossings (578) depending on the type of structure. Earthfill embankment above the culvert structure would still be covered by this Practice. Diversions constructed as part of access road should be covered by Diversion (362). All seeding or revegetation of disturbed areas is provided according to Critical Area Planting (342). Dust control must be addressed under Dust Control on Unpaved Roads and Surfaces (373).

Feature Measure: Length of Roadway

Scenario Unit: Feet

Scenario Typical Size: 1,000.0

Scenario Total Cost: $19,789.29

Scenario Cost/Unit: $19.79

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.37	2000	$2,740.00
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	1330	$5,572.70
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.42	1330	$4,548.60
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	12	$409.44
Materials						
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic Yards	$22.79	275	$6,267.25
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$111.33	0.14	$15.59
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 560 - Access Road

Scenario: #3 - Rehabilitation of existing earth road in dry, level terrain

Scenario Description:

Repair and rehabilitation of compacted earth road in existing alignment in dry, level terrain. The extent of construction work over an existing alignment is assumed to average 20% of the work for a new installation. A properly constructed, well defined access road will address resource concerns related with compaction, emissions of fugitive dust, and excessive sediment in surface water. It also improves the plant productivity, vigor and health and substantially reduces the chance of wild fire hazards. Short term air quality deterioration may result if proper dust control measures are not implemented during the practice installation. Costs include excavation, shaping, grading, surface material, vegetation of disturbed areas and all equipment, labor and incidental materials necessary to install the practice.

Before Situation:

An agricultural enterprise with an existing access road which is beyond its useful lifespan, can no longer be used as intended without rehabilitation. If left in its current condition , it will result in continued compaction, excessive sediment in surface water and emissions of fugitive dusts. This scenario is applicable where the resource activity areas with an existing but dilapidated access road consist of relatively dry and level terrain lands.

After Situation:

The damaged portions of the road will be repaired to a full 14 feet width at the top, mostly in embankment less than 3 feet in height, (average 2 ft), typical side slopes 2:1. A properly repaired access road will greatly reduce or eliminate compaction in land use areas where it is harmful, reduce emissions of fugitive dust and also reduce excessive sediment in surface water by reducing uncontrolled sediment transport and improving drainage of irrigated lands. Planned grades will include all dips and water bars. If clearing and grubbing of land in the alignment area is required, use Land Clearing (460). Pipe culverts installed as part of access road should be covered by either Structures for Water Control (587) or Stream Crossings (578) depending on the type of structure. Earthfill embankment above the culvert structure would still be covered by this Practice. Diversions constructed as part of access road should be covered by Diversion (362). All seeding or revegetation of disturbed areas is provided according to Critical Area Planting (342). Dust control must be addressed under Dust Control on Unpaved Roads and Surfaces (373).

Feature Measure: Length of Roadway

Scenario Unit: Feet

Scenario Typical Size: 1,000.0

Scenario Total Cost: $2,715.44

Scenario Cost/Unit: $2.72

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	270	$1,131.30
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.42	270	$923.40
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	12	$409.44
Materials						
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$111.33	0.14	$15.59
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 560 - Access Road

Scenario: #4 - Rehabilitation of existing gravel road in wet, level terrain

Scenario Description:

Repair and rehabilitation of gravel road with min. 6 inch thick compacted gravel surface on existing alignment in wet, level terrain. The extent of construction work over an existing alignment is assumed to average 20% of the work for a new installation. A properly constructed, well defined access road will address resource concerns related with compaction, emissions of fugitive dust, and excessive sediment in surface water. It also improves the plant productivity, vigor and health and substantially reduces the chance of wild fire hazards. Short term air quality deterioration may result if proper dust control measures are not implemented during the practice installation. Costs include excavation, shaping, grading, surface material, vegetation of disturbed areas and all equipment, labor and incidental materials necessary to install the practice.

Before Situation:

An agricultural enterprise with an existing access road which is beyond its useful lifespan, can no longer be used as intended without rehabilitation. If left in its current condition , it will result in continued compaction, excessive sediment in surface water and emissions of fugitive dusts. This scenario is applicable where the resource activity areas with an existing but dilapidated access road consist of relatively wet and swampy but level terrain lands.

After Situation:

The damaged portions of the road will be repaired to a full 14 feet width with a 6" gravel surface at the top, mostly in embankment less than 3 feet in height, (average 2 ft), typical side slopes 2:1. A properly repaired access road will greatly reduce or eliminate compaction in land use areas where it is harmful, reduce emissions of fugitive dust and also reduce excessive sediment in surface water by reducing uncontrolled sediment transport and improving drainage of irrigated lands. Planned grades will include all dips and water bars. If clearing and grubbing of land in the alignment area is required, use Land Clearing (460). Pipe culverts installed as part of access road should be covered by either Structures for Water Control (587) or Stream Crossings (578) depending on the type of structure. Earthfill embankment above the culvert structure would still be covered by this Practice. Diversions constructed as part of access road should be covered by Diversion (362). All seeding or revegetation of disturbed areas is provided according to Critical Area Planting (342). Dust control must be addressed under Dust Control on Unpaved Roads and Surfaces (373).

Feature Measure: Length of Roadway

Scenario Unit: Feet

Scenario Typical Size: 1,000.0

Scenario Total Cost: $4,486.45

Scenario Cost/Unit: $4.49

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.37	400	$548.00
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	266	$1,114.54
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.42	266	$909.72
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	12	$409.44
Materials						
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic Yards	$22.79	55	$1,253.45
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$111.33	0.14	$15.59
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 560 - Access Road

Scenario: #5 - New earth road in dry, sloped terrain

Scenario Description:

Newly constructed compacted earth road in steep sloped terrain but relatively dry areas. A properly constructed, well defined access road will address resource concerns related with compaction, emissions of fugitive dust, and excessive sediment in surface water. It also improves the plant productivity, vigor and health and substantially reduces the chance of wild fire hazards. Short term air quality deterioration may result if proper dust control measures are not implemented during the practice installation. Costs include excavation, shaping, grading, surface material, vegetation of disturbed areas and all equipment, labor and incidental materials necessary to install the practice.

Before Situation:

An agricultural enterprise which requires, but does not have, a fixed travelway for equipment and vehicles for various resource activities and where use of equipment and vehicles within the enterprise without a defined access road would result in compaction, excessive sediment and turbidity in surface water, reduced visibility, and emissions of fugitive dust. This scenario is applicable where the resource activity areas consist of relatively dry lands with steep slopes.

After Situation:

The road will be 14 feet wide at the top, 50% in embankment and 50% in excavation less than 3 feet in height, (average 2 ft) typical cut and fill side slopes 2:1. Out of total excavation, 80% is considered common earth and 20% hard dig or rocks. A properly constructed, well defined access road will greatly reduce or eliminate compaction in land use areas where it is harmful, reduce emissions of fugitive dust and also reduce excessive sediment in surface water by reducing uncontrolled sediment transport and improving drainage of irrigated lands. Planned grades will include all dips and water bars. If clearing and grubbing of land in the alignment area is required, use Land Clearing (460). Pipe culverts installed as part of access road should be covered by either Structures for Water Control (587) or Stream Crossings (578) depending on the type of structure. Earthfill embankment above the culvert structure would still be covered by this Practice. Diversions constructed as part of access road should be covered by Diversion (362). All seeding or revegetation of disturbed areas is provided according to Critical Area Planting (342). Dust control must be addressed under Dust Control on Unpaved Roads and Surfaces (373).

Feature Measure: Length of Roadway

Scenario Unit: Feet

Scenario Typical Size: 1,000.0

Scenario Total Cost: $7,371.09

Scenario Cost/Unit: $7.37

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Rock, Ripping	47	Excavation, rock, mechanical ripping, includes equipment and labor	Cubic Yards	$4.21	130	$547.30
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	530	$1,102.40
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	665	$2,786.35
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.42	665	$2,274.30
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	12	$409.44
Materials						
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$111.33	0.14	$15.59
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 560 - Access Road

Scenario: #6 - New 6 inch gravel road in wet, sloped terrain

Scenario Description:

Newly Constructed gravel road with min. 6 inch thick compacted gravel surface in steep sloped ground in wet areas. A properly constructed, well defined access road will address resource concerns related with compaction, emissions of fugitive dust, and excessive sediment in surface water. It also improves the plant productivity, vigor and health and substantially reduces the chance of wild fire hazards. Short term air quality deterioration may result if proper dust control measures are not implemented during the practice installation. Costs include excavation, shaping, grading, surface material, vegetation of disturbed areas and all equipment, labor and incidental materials necessary to install the practice.

Before Situation:

An agricultural enterprise which requires, but does not have, a fixed travelway for equipment and vehicles for various resource activities and where use of equipment and vehicles within the enterprise without a defined access road would result in compaction, excessive sediment and turbidity in surface water, reduced visibility, and emissions of fugitive dust. This scenario is applicable where the resource activity areas consist of wet and swampy land areas with steep sloped terrain.

After Situation:

The road will be 14 feet wide with 6 inch gravel surfacing at the top. It is 50% in embankment and 50% in excavation less than 3 feet in height, (average 2 ft) typical side slopes 2:1. A properly constructed, well defined access road will greatly reduce sheet, rill and wind erosion, eliminate compaction in land use areas where it is harmful, reduce emissions of particulate matter (PM) and PM precursors and also reduce excessive sediment in surface water by reducing uncontrolled sediment transport. Planned grades will include all dips and water bars. If clearing and grubbing of land in the alignment area is required, use Land Clearing (460). Pipe culverts installed as part of access road should be covered by either Structures for Water Control (587) or Stream Crossings (578) depending on the type of structure. Earthfill embankment above the culvert structure would still be covered by this Practice. Diversions constructed as part of access road should be covered by Diversion (362). All seeding or revegetation of disturbed areas is provided according to Critical Area Planting (342). Dust control must be addressed under Dust Control on Unpaved Roads and Surfaces (373).

Feature Measure: Length of Roadway

Scenario Unit: Feet

Scenario Typical Size: 1,000.0

Scenario Total Cost: $16,378.34

Scenario Cost/Unit: $16.38

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.37	2000	$2,740.00
Excavation, Rock, Ripping	47	Excavation, rock, mechanical ripping, includes equipment and labor	Cubic Yards	$4.21	130	$547.30
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	530	$1,102.40
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	665	$2,786.35
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.42	665	$2,274.30
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	12	$409.44
Materials						
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic Yards	$22.79	275	$6,267.25
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$111.33	0.14	$15.59
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 560 - Access Road

Scenario: #7 - Rehabilitation of existing earth road in wet, sloped terrain

Scenario Description:

Repair and rehabilitation of compacted earth road in existing alignment in relatively dry but steep sloped terrain. The extent of construction work over an existing alignment is assumed to average 20% of the work for a new installation. A properly constructed, well defined access road will address resource concerns related with compaction, emissions of fugitive dust, and excessive sediment in surface water. It also improves the plant productivity, vigor and health and substantially reduces the chance of wild fire hazards. Short term air quality deterioration may result if proper dust control measures are not implemented during the practice installation. Costs include excavation, shaping, grading, surface material, vegetation of disturbed areas and all equipment, labor and incidental materials necessary to install the practice.

Before Situation:

An agricultural enterprise with an existing access road which is beyond its useful lifespan, can no longer be used as intended without rehabilitation. If left in its current condition , it will result in continued compaction, excessive sediment in surface water and emissions of fugitive dusts. This scenario is applicable where the resource activity areas with an existing but dilapidated access road consist of relatively dry lands with steep sloped terrain.

After Situation:

The damaged portions of the road will be repaired to a full 14 feet width at the top, 50% in embankment and 50% in excavation less than 3 feet in height, (average 2 ft), typical side slopes 2:1. Out of total excavation, 80% is considered common earth excavation and 20% hard dig or rocks. A properly repaired access road will greatly reduce or eliminate compaction in land use areas where it is harmful, reduce emissions of fugitive dust and also reduce excessive sediment in surface water by reducing uncontrolled sediment transport and improving drainage of irrigated lands. Planned grades will include all dips and water bars. If clearing and grubbing of land in the alignment area is required, use Land Clearing (460). Pipe culverts installed as part of access road should be covered by either Structures for Water Control (587) or Stream Crossings (578) depending on the type of structure. Earthfill embankment above the culvert structure would still be covered by this Practice. Diversions constructed as part of access road should be covered by Diversion (362). All seeding or revegetation of disturbed areas is provided according to Critical Area Planting (342). Dust control must be addressed under Dust Control on Unpaved Roads and Surfaces (373).

Feature Measure: Length of Roadway

Scenario Unit: Feet

Scenario Typical Size: 1,000.0

Scenario Total Cost: $2,002.81

Scenario Cost/Unit: $2.00

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Rock, Ripping	47	Excavation, rock, mechanical ripping, includes equipment and labor	Cubic Yards	$4.21	26	$109.46
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	106	$220.48
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	133	$557.27
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.42	133	$454.86
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	12	$409.44
Materials						
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$111.33	0.14	$15.59
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 560 - Access Road

Scenario: #8 - Rehabilitation of existing gravel road in wet, sloped terrain

Scenario Description:

Repair and rehabilitation of gravel road with min. 6 inch thick compacted gravel surface on existing alignment in wet, steep sloped terrain. The extent of construction work over an existing alignment is assumed to average 20% of the work for a new installation. A properly constructed, well defined access road will address resource concerns related with compaction, emissions of fugitive dust, and excessive sediment in surface water. It also improves the plant productivity, vigor and health and substantially reduces the chance of wild fire hazards. Short term air quality deterioration may result if proper dust control measures are not implemented during the practice installation. Costs include excavation, shaping, grading, surface material, vegetation of disturbed areas and all equipment, labor and incidental materials necessary to install the practice.

Before Situation:

An agricultural enterprise with an existing access road which is beyond its useful lifespan, can no longer be used as intended without rehabilitation. If left in its current condition , it will result in continued compaction, excessive sediment in surface water and emissions of fugitive dust. This scenario is applicable where the resource activity areas with an existing but dilapidated access road consist of relatively wet and swampy land with steep sloped terrain.

After Situation:

The damaged portions of the road will be repaired to a full 14 feet width with a 6" gravel surface at the top, 50% in embankment and 50% in excavation less than 3 feet in height, (average 2 ft), typical side slopes 2:1. A properly repaired access road will greatly reduce or eliminate compaction in land use areas where it is harmful, reduce emissions of fugitive dust and also reduce excessive sediment in surface water by reducing uncontrolled sediment transport and improving drainage of irrigated lands. Planned grades will include all dips and water bars. If clearing and grubbing of land in the alignment area is required, use Land Clearing (460). Pipe culverts installed as part of access road should be covered by either Structures for Water Control (587) or Stream Crossings (578) depending on the type of structure. Earthfill embankment above the culvert structure would still be covered by this Practice. Diversions constructed as part of access road should be covered by Diversion (362). All seeding or revegetation of disturbed areas is provided according to Critical Area Planting (342). Dust control must be addressed under Dust Control on Unpaved Roads and Surfaces (373).

Feature Measure: Length of Roadway

Scenario Unit: Feet

Scenario Typical Size: 1,000.0

Scenario Total Cost: $3,804.26

Scenario Cost/Unit: $3.80

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.37	400	$548.00
Excavation, Rock, Ripping	47	Excavation, rock, mechanical ripping, includes equipment and labor	Cubic Yards	$4.21	26	$109.46
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	106	$220.48
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	133	$557.27
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.42	133	$454.86
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	12	$409.44
Materials						
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic Yards	$22.79	55	$1,253.45
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$111.33	0.14	$15.59
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 561 - Heavy Use Area Protection

Scenario: #1 - Reinforced Concrete with sand or gravel foundation

Scenario Description:

The stabilization of areas around facilities that are frequently and intensively used by people, animals or vehicles by surfacing with reinforced concrete on a sand or gravel foundation to provide a stable, non-eroding surface. Installation includes all materials, equipment, vegetation of disturbed areas, and labor to install this practice, The stabilized area will address the resource concerns soil erosion and water quality degradation.

Before Situation:

This practice applies to all land uses where frequently and/or intensively used areas require treatment to address soil erosion and water quality degradation.

After Situation:

The stabilized area is surfaced with approximately 630 square feet of approximately 8 cubic yards of welded wire mesh reinforced concrete with 8 cubic yards of sand or gravel foundation material for surfacing areas around facilities that are frequently and intensively used by people, animals or vehicles and will address soil erosion and water quality degradation. All seeding or revegetation of disturbed areas is provided. All needed roads must use Access Road (560). Any needed treatment of stream crossings must use Stream Crossing (578). Any needed vegetation of disturbed areas must use Critical Area Planting (342). Provisions to collect, store, utilize, and or treat contaminated runoff must use Sediment Basin (350), Waste Storage Facility (313), or Waste Treatment (629) as appropriate. To reduce the potential for air quality problems from particulate matter associated with heavy use areas, consider the use of Windbreak/Shelterbelt Establishment (380) or Herbaceous Wind Barriers (603).

Feature Measure: Area

Scenario Unit: Square Feet

Scenario Typical Size: 630.0

Scenario Total Cost: $3,526.51

Scenario Cost/Unit: $5.60

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$372.36	8	$2,978.88
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	4	$8.32
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	3	$72.57
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic Yards	$28.74	8	$229.92
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$111.33	0.01	$1.11
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 561 - Heavy Use Area Protection

Scenario: #2 - Rock/Gravel on Geotextile

Scenario Description:

The stabilization of areas around facilities that are frequently and intensively used by people, animals or vehicles by surfacing with rock and or gravel on a geotextile fabric foundation to provide a stable, non-eroding surface. Installation includes all materials, equipment, vegetation of disturbed areas and labor to install this practice, The stabilized area will address the resource concerns of soil erosion and water quality degradation.

Before Situation:

This practice applies to all land uses where frequently and/or intensively used areas require treatment to address soil erosion and water quality degradation.

After Situation:

The stabilized area is surfaced with approximately 630 square feet of rock and or gravel on approximately 70 square yards of geotextile fabric foundation material for surfacing areas around facilities that are frequently and intensively used by people, animals or vehicles and will address soil erosion and water quality degradation. All seeding or revegetation of disturbed areas is provided. All needed roads must use Access Road (560). Any needed treatment of stream crossings must use Stream Crossing (578). Any needed vegetation of disturbed areas must use Critical Area Planting (342). Provisions to collect, store, utilize, and or treat contaminated runoff must use Sediment Basin (350), Waste Storage Facility (313), or Waste Treatment (629) as appropriate. To reduce the potential for air quality problems from particulate matter associated with heavy use areas, consider the use of Windbreak/Shelterbelt Establishment (380) or Herbaceous Wind Barriers (603).

Feature Measure: Area of Rock and or Gravel

Scenario Unit: Square Feet

Scenario Typical Size: 630.0

Scenario Total Cost: $654.17

Scenario Cost/Unit: $1.04

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.37	70	$95.90
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	4	$8.32
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	3	$72.57
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	8	$240.56
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$111.33	0.01	$1.11
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 561 - Heavy Use Area Protection

Scenario: #3 - Rock/Gravel-GeoCell-Geotextile

Scenario Description:

The stabilization of areas around facilities that are frequently and intensively used by people, animals or vehicles by surfacing with rock and or gravel in a cellular containment grid on a geotextile fabric foundation to provide a stable, non-eroding surface. Installation includes all materials, equipment, vegetation of disturbed areas and labor to install this practice. The stabilized area will address the resource concerns of soil erosion and water quality degradation.

Before Situation:

This practice applies to all land uses where frequently and/or intensively used areas require treatment to address soil erosion and water quality degradation.

After Situation:

The stabilized area is surfaced with approximately 630 square feet of rock and or gravel in approximately 70 square yards of cellular containment grid on approximately 70 square yards of geotextile fabric foundation material for surfacing areas around facilities that are frequently and intensively used by people, animals or vehicles and will address soil erosion and water quality degradation. All seeding or revegetation of disturbed areas is provided. All needed roads must use Access Road (560). Any needed treatment of stream crossings must use Stream Crossing (578). Any needed vegetation of disturbed areas must use Critical Area Planting (342). Provisions to collect, store, utilize, and or treat contaminated runoff must use Sediment Basin (350), Waste Storage Facility (313), or Waste Treatment (629) as appropriate. To reduce the potential for air quality problems from particulate matter associated with heavy use areas, consider the use of Windbreak/Shelterbelt Establishment (380) or Herbaceous Wind Barriers (603).

Feature Measure: Area of Rock and or Gravel

Scenario Unit: Square Feet

Scenario Typical Size: 630.0

Scenario Total Cost: $2,278.87

Scenario Cost/Unit: $3.62

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.37	70	$95.90
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	4	$8.32
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	3	$72.57
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	8	$240.56
GeoCell, 4 inch	1054	4-inch thick cellular confinement system, three-dimensional, expandable panels made from high-density polyethylene (HDPE), polyester or another polymer material. Includes materials, labor and equipment for the geocell only, does not include backfill	Square Yard	$23.21	70	$1,624.70
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$111.33	0.01	$1.11
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 561 - Heavy Use Area Protection

Scenario: #4 - Fly Ash on Geotextile

Scenario Description:

The stabilization of areas around facilities that are frequently and intensively used by people, animals or vehicles by surfacing with Fly Ash on a geotextile fabric foundation to provide a stable, non-eroding surface. Installation includes all materials, equipment, vegetation of disturbed areas and labor to install this practice. The stabilized area will address the resource concerns of soil erosion and water quality degradation.

Before Situation:

This practice applies to all land uses where frequently and/or intensively used areas require treatment to address soil erosion and water quality degradation.

After Situation:

The stabilized area is surfaced with approximately 630 square feet of Fly Ash on approximately 70 square yards of geotextile fabric foundation material for surfacing areas around facilities that are frequently and intensively used by people, animals or vehicles and will address soil erosion and water quality degradation. All seeding or revegetation of disturbed areas is provided. All needed roads must use Access Road (560). Any needed treatment of stream crossings must use Stream Crossing (578). Any needed vegetation of disturbed areas must use Critical Area Planting (342). Provisions to collect, store, utilize, and or treat contaminated runoff must use Sediment Basin (350), Waste Storage Facility (313), or Waste Treatment (629) as appropriate. To reduce the potential for air quality problems from particulate matter associated with heavy use areas, consider the use of Windbreak/Shelterbelt Establishment (380) or Herbaceous Wind Barriers (603).

Feature Measure: Area of Fly Ash

Scenario Unit: Square Feet

Scenario Typical Size: 630.0

Scenario Total Cost: $1,199.21

Scenario Cost/Unit: $1.90

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.37	70	$95.90
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	4	$8.32
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$96.65	4	$386.60
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	3	$72.57
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	5	$168.20
Materials						
Fly Ash, BAB	52	Fly Ash, Bottom Ash Blend, includes material and delivery	Cubic Yards	$28.85	8	$230.80
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$111.33	0.01	$1.11
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 561 - Heavy Use Area Protection

Scenario: #5 - Bituminous Concrete Pavement

Scenario Description:

The stabilization of areas around facilities that are frequently and intensively used by people, animals or vehicles by surfacing with bituminous concrete pavement on aggregate gravel foundation to provide a stable, non-eroding surface. Installation includes all materials, equipment, vegetation of disturbed areas and labor to install this practice. The stabilized area will address the resource concerns of soil erosion and water quality degradation.

Before Situation:

This practice applies to all land uses where frequently and/or intensively used areas require treatment to address soil erosion and water quality degradation.

After Situation:

The stabilized area is surfaced with approximately 630 square feet of bituminous concrete pavement on 8 cubic yards of aggregate gravel material for surfacing areas around facilities that are frequently and intensively used by people, animals or vehicles and will address soil erosion and water quality degradation. All seeding or revegetation of disturbed areas is provided. All needed roads must use Access Road (560). Any needed treatment of stream crossings must use Stream Crossing (578). Any needed vegetation of disturbed areas must use Critical Area Planting (342). Provisions to collect, store, utilize, and or treat contaminated runoff must use Sediment Basin (350), Waste Storage Facility (313), or Waste Treatment (629) as appropriate. To reduce the potential for air quality problems from particulate matter associated with heavy use areas, consider the use of Windbreak/Shelterbelt Establishment (380) or Herbaceous Wind Barriers (603).

Feature Measure: Area of Bituminous Pavement

Scenario Unit: Square Feet

Scenario Typical Size: 630.0

Scenario Total Cost: $2,063.97

Scenario Cost/Unit: $3.28

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	4	$8.32
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	3	$72.57
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	8	$240.56
Asphalt, pavement	1867	Bituminous Concrete,includes materials, equipment and labor for 4 inch layer, base not included.	Square Feet	$2.39	630	$1,505.70
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$111.33	0.01	$1.11
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 570 - Stormwater Runoff Control

Scenario: #1 - Combination, Most common Best Management Practices

Scenario Description:

This scenario involves installation of silt fence, straw wattles, and straw bales on the construction site as part of one conservation engineering system. The combined system shall include two or more components and will address the resource concerns related with concentrated flow erosion, excessive sediment in surface waters as well as protection of existing inlets and structures depending on the combination.

Before Situation:

The combination scenario is applicable in all construction sites and watersheds including those in the urban and suburban areas. Which component would apply in a particular situation would depend on the site condition, slope etc.

After Situation:

When properly installed, the combination structures slow down runoff flow velocity and reduce high velocity erosion, detain and filter the stormwater runoff and provide a controlled release to the downstream areas. In seeded areas, straw wattles also enable seeds to settle and germinate, aiding the revegetation process. By filtering overland runoff and holding sediment on the slope, Straw Wattles also help to protect lakes, ponds, rivers and streams from sediment pollution. By filtering overland runoff and holding sediment on the slope, straw bales can also help to protect water quality. Silt fence are installed along the downstream perimeter of a construction site to prevent sediment transport off construction areas. A typical silt fence consists of a synthetic filter fabric stretched between a series of fence stakes, with the stakes installed on the downstream side of the perimeter and the fabric trenched into the soil on the upstream side and backfilled. All erosion control blankets and straw mulches will be covered under 484-Mulching. If earthen basins are warranted for water quality improvement or retention/detention purposes, use Sediment Basin (350). If seeding is warranted for water quality and erosion control purposes, all temporary and permenant vegetation will use Critical Area Planting (342).

Feature Measure: Area of construction site

Scenario Unit: Acres

Scenario Typical Size: 1.0

Scenario Total Cost: $834.10

Scenario Cost/Unit: $834.10

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	1.5	$33.44
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	10	$241.90
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	1.5	$68.01
Materials						
Silt Fence	43	Silt Fence with support post. Includes materials, equipment and labor	Feet	$1.66	100	$166.00
Wattles, straw, 8-9 in. x 25 ft.	1405	Tubes of rice straw, approximately 8-9 inch in diameter, 25 feet long . Includes materials and shipping only (including stakes).	Feet	$1.09	100	$109.00
Straw bales	2186	Straw bales buried at defined intervals to halt rill and gulley formation. Materials and shipping only.	Each	$8.63	25	$215.75

Practice: 572 - Spoil Disposal

Scenario: #1 - Spoil Spreading

Scenario Description:
A spoil pile is spread over a designated area according to an approved plan. The resource concerns are Soil Erosion and Water Quality Degradation.

Before Situation:
Spoil material is available from excavation of channels, drainage ditches, irrigation canals, or other construction sites.

After Situation:
Land has been shaped to the required elevations and grades. Resource concerns have been treated. Associated practices, like critical area planting or irrigation/drainage water management practices, would be contracted seperately as needed.

Feature Measure: Cubic yards of spoil spread

Scenario Unit: Cubic Yards

Scenario Typical Size: 1,000.0

Scenario Total Cost: $2,364.96

Scenario Cost/Unit: $2.36

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$96.65	10	$966.50
Scraper, pull, 7 CY	1206	Pull type earthmoving scraper with 7 CY capacity. Does not include pulling equipment or labor. Add Tractor or Dozer, 160 HP typically required for single scraper.	Hours	$16.20	10	$162.00
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	10	$336.40
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	2	$900.06

Practice: 574 - Spring Development

Scenario: #1 - Spring Development

Scenario Description:

Develop a water source from a natural spring or seep (i.e., spring development) to provide water for livestock and/or wildlife needs. This typical scenario includes excavating and exposing the water source at the spring/seep (typically on a hillside), constructing a water collection structure by installing a 50 ft long, 4 inch diameter HDPE perforated pipe enclosed in a sand/gravel envelope overlaid by 2 ft wide filter fabric (50 ft long) and behind a concrete cutoff wall (6 inch x 4 ft height x 25 ft long) to retain water. Water is directed (via 20 ft long, 4 inch PVC) to a spring box (48 inch diameter x 6 ft long CMP) that is located at the cutoff wall or below the wall, equipped with a watertight lid and two outlets. One outlet serves as overflow pipe to account for occasions where inflow exceeds outflow. The collection system is commonly composed of a single or a network of perforated 4 inch diameter drainage pipe placed in an excavated collection trench that runs across the slope. The outflow pipe from the spring box can be directed to buried large storage (not included), and to a watering facility (not included) for use Resource Concern: Livestock production limitation - Inadequate livestock water. Associated Practices: 516-Livestock Pipeline; 614-Watering Facility; 382-Fence; Critical Area Planting (342).

Before Situation:

Livestock operation with inadequate fresh water for livestock and an on-site undeveloped spring/seep.

After Situation:

Spring development system provides adequate water for the intended use. The system typically runs all year long in most zones.

Feature Measure: Number of Developments

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $3,909.47

Scenario Cost/Unit: $3,909.47

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$494.40	2	$988.80
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.37	11	$15.07
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$29.47	16	$471.52
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	32	$774.08
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	16	$423.36
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic Yards	$28.74	2	$57.48
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	2	$60.14
Pipe, PVC, 4 in., SCH 40	978	Materials: - 4 inch - PVC - SCH 40 - ASTM D1785	Feet	$3.74	20	$74.80
Pipe, HDPE, 4 in., PCPT, Single Wall	1270	Pipe, Corrugated Plastic Tubing, Single Wall, Perforated, 4 inch diameter - ASTM F405. Material cost only.	Feet	$0.52	50	$26.00
Pipe, CMP, 48 in., 14 Gauge	1280	48 inch Corrugated Metal Pipe, Galvanized, Uncoated, 14 gage. Material cost only.	Feet	$56.88	6	$341.28
Spring Collection Box Cover, steel, 4 ft. diameter	1281	4 foot diameter x 1/4 inch thick Steel lid with handle for spring collection box. Materials and fabrication.	Each	$205.52	1	$205.52
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 574 - Spring Development

Scenario: #2 - Spring Development - Remote Locations

Scenario Description:

Develop a water source from a natural spring or seep (i.e., spring development) to provide water for livestock and/or wildlife needs in remote areas typically 50 or more miles from source of equipment and/or materials. This typical scenario includes excavating and exposing the water source at the spring/seep (typically on a hillside), constructing a water collection structure by installing a 50 ft long, 4 inch diameter HDPE perforated pipe enclosed in a sand/gravel envelope overlaid by 2 ft wide filter fabric (50 ft long) and behind a concrete cutoff wall (6 inch x 4 ft height x 25 ft long) to retain water. Water is directed (via 20 ft long, 4 inch PVC) to a spring box (48 inch diameter x 6 ft long CMP) that is located at the cutoff wall or below the wall, equipped with a watertight lid and two outlets. One outlet serves as overflow pipe to account for occasions where inflow exceeds outflow. The collection system is commonly composed of a single or a network of perforated 4 inch diameter drainage pipe placed in an excavated collection trench that runs across the slope. The outflow pipe from the spring box can be directed to buried large storage (not included), and to a watering facility (not included) for use Resource Concern: Livestock production limitation - Inadequate livestock water. Associated Practices: 516-Livestock Pipeline; 614-Watering Facility; 382-Fence; Critical Area Planting (342).

Before Situation:

Livestock operation with inadequate fresh water for livestock and an on-site undeveloped spring/seep.

After Situation:

Spring development system provides adequate water for the intended use. The system typically runs all year long in most zones.

Feature Measure: Number of Developments

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $4,509.47

Scenario Cost/Unit: $4,509.47

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$494.40	2	$988.80
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.37	11	$15.07
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$29.47	16	$471.52
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	32	$774.08
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	16	$423.36
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic Yards	$28.74	2	$57.48
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	2	$60.14
Pipe, PVC, 4 in., SCH 40	978	Materials: - 4 inch - PVC - SCH 40 - ASTM D1785	Feet	$3.74	20	$74.80
Pipe, HDPE, 4 in., PCPT, Single Wall	1270	Pipe, Corrugated Plastic Tubing, Single Wall, Perforated, 4 inch diameter - ASTM F405. Material cost only.	Feet	$0.52	50	$26.00
Pipe, CMP, 48 in., 14 Gauge	1280	48 inch Corrugated Metal Pipe, Galvanized, Uncoated, 14 gage. Material cost only.	Feet	$56.88	6	$341.28
Spring Collection Box Cover, steel, 4 ft. diameter	1281	4 foot diameter x 1/4 inch thick Steel lid with handle for spring collection box. Materials and fabrication.	Each	$205.52	1	$205.52
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	600	$600.00
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 575 - Trails and Walkways

Scenario: #1 - Earth or Vegetated Trail

Scenario Description:

Layout and construct an earth or vegetated trail to facilitate the movement of animals, people, or off-road vehicles to provide or improve access to forage, water, working/handling facilities, and/or shelter, Improve grazing efficiency and distribution, and/or protect ecologically sensitive, erosive and/or potentially erosive sites, pedestrian or off-road vehicle access to agricultural, construction, or maintenance operations, provide trails for recreational activities or access to recreation sites and address the resource conerns of soil erosion and water quality degradation. Costs include excavation, shaping, grading, earth and or vegetated surfaces and all equipment, labor and incidental materials necessary to install the practice.

Before Situation:

This practice applies on all lands where management of animal or human movement is needed to address soil erosion and water quality resource concerns. This practice applies to a trails or walkways constructed for use by off-road vehicles, such as All-Terrain Vehicles or snowmobiles, which are not designed for use on public roads. It does not apply to roads constructed for movement of equipment or vehicles. Use NRCS Conservation Practice Standard Access Road (Code 560).

After Situation:

The typical trail will be a 12 foot wide 300 foot long, 3600 square foot lane of earth and vegetation. All excavation, grading and shaping necessary to provide a smooth permanent travel surface for livestock or people is included. Included is 45 CY of excavation, vegetation of 1800 square foot for sufacing, 1800 square foot of earthen surfacing and vegetation of 900 square foot of disturbed areas. Consider the adequacy of natural surfacing. If the lane requires planting, the vegetation is provided. Where earth and or vegetation is not practical, adequate surface protection is provided under a different sceanrio. Stream Crossing, Code 578, will be used when the trail or lane crosses streams or shallow water areas. Consider the use of water bars to control and direct water flow in the trail. All culverts will be applied under Structure for Water Control (587). Use Access Road, Code 560 and Diversion (362) as appropriate. Fencing, Code 382, will be used when needed to control animal movement.

Feature Measure: Area of trail

Scenario Unit: Square Feet

Scenario Typical Size: 3,600.0

Scenario Total Cost: $1,036.31

Scenario Cost/Unit: $0.29

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	22	$45.76
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.89	3	$152.67
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	3	$66.87
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	4	$136.48
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	8	$193.52
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	6	$201.84
Materials						
Introduced Perennial Grasses, Legumes and/or Forbs, Low Density	2747	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$30.75	0.04	$1.23
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$111.33	0.02	$2.23
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 575 - Trails and Walkways

Scenario: #2 - Reinforced Concrete Walkway

Scenario Description:

Layout and construct an reinforced concrete walkway on a sand foundation to facilitate the movement of animals, people, or off-road vehicles to provide or improve access to forage, water, working/handling facilities, and/or shelter, Improve grazing efficiency and distribution, and/or protect ecologically sensitive, erosive and/or potentially erosive sites, pedestrian or off-road vehicle access to agricultural, construction, or maintenance operations, provide walkways for recreational activities or access to recreation sites and address the resource conerns of soil erosion and water quality degradation. Costs include excavation, shaping, grading, reinforced concrete surfacing, vegetation of disturbed areas, all equipment, labor and incidental materials necessary to install the practice.

Before Situation:

This practice applies on all lands where management of animal or human movement is needed to address soil erosion and water quality resource concerns. This practice applies to a trails or walkways constructed for use by off-road vehicles, such as All-Terrain Vehicles or snowmobiles, which are not designed for use on public roads. It does not apply to roads constructed for movement of equipment or vehicles. Use NRCS Conservation Practice Standard Access Road (Code 560).

After Situation:

The typical walkway will be a 12 foot wide 300 foot long, 3600 square foot of reinforced concrete. All excavation, grading and shaping necessary to provide a smooth permanent travel surface for livestock or people is included. Included is reinforced concrete of 3600 square foot for sufacing, and vegetation of 900 square foot of disturbed areas. The walkway consist of approximately 22 CY of excavation, 45 CY of reinforced concrete with a 45 CY sand foundation. Stream Crossing, Code 578, will be used when the walkway crosses streams or shallow water areas. All culvets will be applied under Structure for Water Control (587). Use Access Road, Code 560 and Diversion (362) as appropriate. Fencing, Code 382, will be used when needed to control animal movement.

Feature Measure: Area of Walkway

Scenario Unit: Square Feet

Scenario Typical Size: 3,600.0

Scenario Total Cost: $18,911.09

Scenario Cost/Unit: $5.25

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$372.36	45	$16,756.20
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	22	$45.76
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.89	3	$152.67
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	3	$66.87
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	4	$136.48
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	5	$120.95
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	3	$100.92
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic Yards	$28.74	45	$1,293.30
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$111.33	0.02	$2.23
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 575 - Trails and Walkways

Scenario: #3 - Rock/Gravel on Geotextile, Walkway

Scenario Description:

Layout and construct a walkway with rock and or gravel on a geotextile fabric foundation surface treatment, to facilitate the movement of animals, people, or off-road vehicles to provide or improve access to forage, water, working/handling facilities, and/or shelter, Improve grazing efficiency and distribution, and/or protect ecologically sensitive, erosive and/or potentially erosive sites, pedestrian or off-road vehicle access to agricultural, construction, or maintenance operations, provide walkways for recreational activities or access to recreation sites and address the resource conerns of soil erosion and water quality degradation. Costs include excavation, shaping, grading, rock and or gravel, geotextile, vegetation of disturbed areas, all equipment, labor and incidental materials necessary to install the practice.

Before Situation:

This practice applies on all lands where management of animal or human movement is needed to address soil erosion and water quality resource concerns. This practice applies to a trails or walkways constructed for use by off-road vehicles, such as All-Terrain Vehicles or snowmobiles, which are not designed for use on public roads. It does not apply to roads constructed for movement of equipment or vehicles. Use NRCS Conservation Practice Standard Access Road (Code 560).

After Situation:

The typical walkway will be a 12 foot wide 300 foot long, 3600 square foot of rock and or gravel on a geotextile fabric foundation surface treatment. All excavation, grading and shaping necessary to provide a smooth permanent travel surface for livestock or people is included. Included is aggregrate gravel of 3600 square foot for sufacing, and vegetation of 900 square foot of disturbed areas. The walkway consist of approximately 22 CY of excavation, 45 CY of aggregrate gravel on a 400 SY of geotextile fabric foundation. Stream Crossing, Code 578, will be used when the walkway crosses streams or shallow water areas. All culvets will be applied under Structure for Water Control (587). Use Access Road, Code 560 and Diversion (362) as appropriate. Fencing, Code 382, will be used when needed to control animal movement.

Feature Measure: Area of Walkway

Scenario Unit: Square Feet

Scenario Typical Size: 3,600.0

Scenario Total Cost: $2,762.74

Scenario Cost/Unit: $0.77

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.37	400	$548.00
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	22	$45.76
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.89	3	$152.67
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	3	$66.87
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	4	$136.48
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	5	$120.95
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	3	$100.92
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	45	$1,353.15
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$111.33	0.02	$2.23
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 575 - Trails and Walkways

Scenario: #4 - Rock/Gravel in GeoCell on Geotextile, Walkway

Scenario Description:

Layout and construct a walkway with rock and or gravel in a cellular containment grid on a geotextile fabric foundation surface treatment, to facilitate the movement of animals, people, or off-road vehicles to provide or improve access to forage, water, working/handling facilities, and/or shelter, Improve grazing efficiency and distribution, and/or protect ecologically sensitive, erosive and/or potentially erosive sites, pedestrian or off-road vehicle access to agricultural, construction, or maintenance operations, provide walkways for recreational activities or access to recreation sites and address the resource conerns of soil erosion and water quality degradation. Costs include excavation, shaping, grading, rock and or gravel, containment grid, geotextile, vegetation of disturbed areas, all equipment, labor and incidental materials necessary to install the practice.

Before Situation:

This practice applies on all lands where management of animal or human movement is needed to address soil erosion and water quality resource concerns. This practice applies to a trails or walkways constructed for use by off-road vehicles, such as All-Terrain Vehicles or snowmobiles, which are not designed for use on public roads. It does not apply to roads constructed for movement of equipment or vehicles. Use NRCS Conservation Practice Standard Access Road (Code 560).

After Situation:

The typical walkway will be a 12 foot wide 300 foot long, 3600 square foot of rock and or gravel in a cellular containment grid on a geotextile fabric foundation surface treatment. All excavation, grading and shaping necessary to provide a smooth permanent travel surface for livestock or people is included. Included is aggregrate gravel of 3600 square foot for sufacing, and vegetation of 900 square foot of disturbed areas. The walkway consist of approximately 22 CY of excavation, 45 CY of aggregrate gravel in 400 SY of 4 inch geocell on a 400 SY of geotextile fabric foundation. Stream Crossing, Code 578, will be used when the walkway crosses streams or shallow water areas. All culvets will be applied under Structure for Water Control (587). Use Access Road, Code 560 and Diversion (362) as appropriate. Fencing, Code 382, will be used when needed to control animal movement.

Feature Measure: Area of Walkway

Scenario Unit: Square Feet

Scenario Typical Size: 3,600.0

Scenario Total Cost: $12,046.74

Scenario Cost/Unit: $3.35

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.37	400	$548.00
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	22	$45.76
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.89	3	$152.67
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	3	$66.87
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	4	$136.48
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	5	$120.95
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	3	$100.92
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	45	$1,353.15
GeoCell, 4 inch	1054	4-inch thick cellular confinement system, three-dimensional, expandable panels made from high-density polyethylene (HDPE), polyester or another polymer material. Includes materials, labor and equipment for the geocell only, does not include backfill	Square Yard	$23.21	400	$9,284.00
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$111.33	0.02	$2.23
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 575 - Trails and Walkways

Scenario: #5 - Fly Ash on Geotextile, Walkway

Scenario Description:

Layout and construct a walkway with Fly Ash on a geotextile fabric foundation surface treatment, to facilitate the movement of animals, people, or off-road vehicles to provide or improve access to forage, water, working/handling facilities, and/or shelter, Improve grazing efficiency and distribution, and/or protect ecologically sensitive, erosive and/or potentially erosive sites, pedestrian or off-road vehicle access to agricultural, construction, or maintenance operations, provide walkways for recreational activities or access to recreation sites and address the resource conerns of soil erosion and water quality degradation. Costs include excavation, shaping, grading, Fly Ash, geotextile, vegetation of disturbed areas, all equipment, labor and incidental materials necessary to install the practice.

Before Situation:

This practice applies on all lands where management of animal or human movement is needed to address soil erosion and water quality resource concerns. This practice applies to a trails or walkways constructed for use by off-road vehicles, such as All-Terrain Vehicles or snowmobiles, which are not designed for use on public roads. It does not apply to roads constructed for movement of equipment or vehicles. Use NRCS Conservation Practice Standard Access Road (Code 560).

After Situation:

The typical walkway will be a 12 foot wide 300 foot long, 3600 square foot of Fly Ash on a geotextile fabric foundation surface treatment. All excavation, grading and shaping necessary to provide a smooth permanent travel surface for livestock or people is included. Included is Fly Ash of 3600 square foot for sufacing, and vegetation of 900 square foot of disturbed areas. The walkway consist of approximately 22 CY of excavation, 45 CY of Fly Ash on a 400 SY of geotextile fabric foundation. Stream Crossing, Code 578, will be used when the walkway crosses streams or shallow water areas. All culvets will be applied under Structure for Water Control (587). Use Access Road, Code 560 and Diversion (362) as appropriate. Fencing, Code 382, will be used when needed to control animal movement.

Feature Measure: Area of Walkway

Scenario Unit: Square Feet

Scenario Typical Size: 3,600.0

Scenario Total Cost: $2,845.12

Scenario Cost/Unit: $0.79

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.37	400	$548.00
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	22	$45.76
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$96.65	3	$289.95
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	3	$66.87
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	4	$136.48
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	5	$120.95
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	3	$100.92
Materials						
Fly Ash, BAB	52	Fly Ash, Bottom Ash Blend, includes material and delivery	Cubic Yards	$28.85	45	$1,298.25
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$111.33	0.02	$2.23
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 575 - Trails and Walkways

Scenario: #6 - Bituminous Concrete Pavement, Walkway

Scenario Description:

Layout and construct a bituminous concrete pavement surface treatment on aggregate gravel foundation walkway to facilitate the movement of animals, people, or off-road vehicles to provide or improve access to forage, water, working/handling facilities, and/or shelter, Improve grazing efficiency and distribution, and/or protect ecologically sensitive, erosive and/or potentially erosive sites, pedestrian or off-road vehicle access to agricultural, construction, or maintenance operations, provide walkways for recreational activities or access to recreation sites and address the resource conerns of soil erosion and water quality degradation. Costs include excavation, shaping, grading, bituminous concrete pavement surfacing, vegetation of disturbed areas, all equipment, labor and incidental materials necessary to install the practice.

Before Situation:

This practice applies on all lands where management of animal or human movement is needed to address soil erosion and water quality resource concerns. This practice applies to a trails or walkways constructed for use by off-road vehicles, such as All-Terrain Vehicles or snowmobiles, which are not designed for use on public roads. It does not apply to roads constructed for movement of equipment or vehicles. Use NRCS Conservation Practice Standard Access Road (Code 560).

After Situation:

The typical walkway will be a 12 foot wide 300 foot long, 3600 square foot of bituminous concrete pavement on aggregate gravel foundation. All excavation, grading and shaping necessary to provide a smooth permanent travel surface for livestock or people is included. Included is bituminous concrete pavement of 3600 square foot for sufacing, and vegetation of 900 square foot of disturbed areas. The walkway consist of approximately 22 CY of excavation, 3600 square feet bituminous concrete pavement, with a 45 CY gravel foundation. Stream Crossing, Code 578, will be used when the walkway crosses streams or shallow water areas. All culvets will be applied under Structure for Water Control (587). Use Access Road, Code 560 and Diversion (362) as appropriate. Fencing, Code 382, will be used when needed to control animal movement.

Feature Measure: Area of Walkway

Scenario Unit: Square Feet

Scenario Typical Size: 3,600.0

Scenario Total Cost: $10,956.02

Scenario Cost/Unit: $3.04

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	22	$45.76
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$96.65	3	$289.95
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	3	$66.87
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	4	$136.48
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	5	$120.95
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	3	$100.92
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	45	$1,353.15
Asphalt, pavement	1867	Bituminous Concrete,includes materials, equipment and labor for 4 inch layer, base not included.	Square Feet	$2.39	3600	$8,604.00
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$111.33	0.02	$2.23
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 575 - Trails and Walkways

Scenario: #7 - Wood Chips, Walkway

Scenario Description:

Layout and construct a wood chip surface treatment on a earthen foundation walkway to facilitate the movement of animals, people, or off-road vehicles to provide or improve access to forage, water, working/handling facilities, and/or shelter, Improve grazing efficiency and distribution, and/or protect ecologically sensitive, erosive and/or potentially erosive sites, pedestrian or off-road vehicle access to agricultural, construction, or maintenance operations, provide walkways for recreational activities or access to recreation sites and address the resource conerns of soil erosion and water quality degradation. Costs include excavation, shaping, grading, wood chip surfacing, vegetation of disturbed areas, all equipment, labor and incidental materials necessary to install the practice.

Before Situation:

This practice applies on all lands where management of animal or human movement is needed to address soil erosion and water quality resource concerns. This practice applies to a trails or walkways constructed for use by off-road vehicles, such as All-Terrain Vehicles or snowmobiles, which are not designed for use on public roads. It does not apply to roads constructed for movement of equipment or vehicles. Use NRCS Conservation Practice Standard Access Road (Code 560).

After Situation:

The typical walkway will be a 12 foot wide 300 foot long, 3600 square foot of wood chip srface treatment on earthen foundation. All excavation, grading and shaping necessary to provide a smooth permanent travel surface for livestock or people is included. Included is wood chips of 3600 square foot for sufacing, and vegetation of 900 square foot of disturbed areas. The walkway consist of approximately 22 CY of excavation, 3600 square feet of wood chip surfacing. Stream Crossing, Code 578, will be used when the walkway crosses streams or shallow water areas. All culvets will be applied under Structure for Water Control (587). Use Access Road, Code 560 and Diversion (362) as appropriate. Fencing, Code 382, will be used when needed to control animal movement.

Feature Measure: Area of Walkway

Scenario Unit: Square Feet

Scenario Typical Size: 3,600.0

Scenario Total Cost: $2,939.75

Scenario Cost/Unit: $0.82

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	22	$45.76
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.89	3	$152.67
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	3	$66.87
Aggregate, Wood Chips	1098	Includes materials, equipment and labor	Cubic Yards	$50.28	45	$2,262.60
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	4	$96.76
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	3	$79.38
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 576 - Livestock Shelter Structure

Scenario: #1 - Prefabricated Portable Shade Structure

Scenario Description:

A flexible membrane or fabric-like roof placed on a steel or wood portable frame used to promote animal health where prescribed grazing practices have limited livestock access to shade. Cost estimate is based upon a 10 ft x 20 ft prefab portable structure. Associated practices include Fence (382), Prescribed Grazing (528), and Watering Facility (614).

Before Situation:

Livestock are being managed using a prescribed grazing plan resulting in a lack of shade during the summer months. The livestock are stressed and eat less frequently.

After Situation:

Livestock shade structures are rotated and sized according to NRCS plans and specifications. Livestock access to water, shade, and forage are dispersed to decrease animal stress and promote a better grazing and nutrient spreading.

Feature Measure: Area of Roof Frame

Scenario Unit: Square Feet

Scenario Typical Size: 200.0

Scenario Total Cost: $1,093.86

Scenario Cost/Unit: $5.47

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	8	$178.32
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	8	$193.52
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	3	$136.02
Materials						
Hoop House, quonset style, base package	1277	Includes the framework complete with all predrilled steel, hardware and instructions. Includes 6 mil 4-year polyethylene film to cover tunnel, and polylock for sides and ends for a quonset style (round top) hoop house. Materials and shipping only, does not include labor.	Square Feet	$2.93	200	$586.00

Practice: 576 - Livestock Shelter Structure

Scenario: #2 - Portable Shade Structure

Scenario Description:

A flexible membrane or fabric-like roof placed on a steel or wood portable frame used to promote animal health where prescribed grazing practices have limited livestock access to shade. Cost estimate is based upon a 25 ft x 40 ft portable structure. Associated practices include Fence (382), Prescribed Grazing (528), and Watering Facility (614).

Before Situation:

Livestock are being managed using a prescribed grazing plan resulting in a lack of shade during the summer months. The livestock are stressed and eat less frequently.

After Situation:

Livestock shade structures are rotated and sized according to NRCS plans and specifications. Livestock access to water, shade, and forage are dispersed to decrease animal stress and promote a better grazing and nutrient spreading.

Feature Measure: Area of Roof Frame

Scenario Unit: Square Feet

Scenario Typical Size: 1,000.0

Scenario Total Cost: $4,548.07

Scenario Cost/Unit: $4.55

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	8	$178.32
Portable Welder	1407	Portable field welder. Equipment only. Labor not included.	Hours	$18.64	16	$298.24
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	16	$545.92
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	8	$193.52
Materials						
Pipe, PVC, 2 in., SCH 40	976	Materials: - 2 inch - PVC - SCH 40 - ASTM D1785	Feet	$1.27	25	$31.75
Steel, Plate, 3/16 in.	1048	Flat Steel Plate, 3/16 inch thick, materials only.	Square Feet	$6.02	2	$12.04
Pipe, Steel, 1 1/4 in., SCH 40	1103	Materials: - 1 1/4 inch - Steel SCH 40	Feet	$4.71	94	$442.74
Pipe, Steel, 2 in., SCH 40	1105	Materials: - 2 inch - Steel SCH 40	Feet	$7.57	185	$1,400.45
Synthetic Liner, 60 mil	2109	Synthetic 60 mil HDPE, LLDPE, EPDM, etc membrane liner material. Includes materials and shipping only.	Square Feet	$1.38	1000	$1,380.00
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	1	$65.09

Practice: 576 - Livestock Shelter Structure

Scenario: #3 - Portable Fabricated Wind Shelter, equal to or greater than 8 foot

Scenario Description:

Portable Livestock Fabricated Wind Shelter is installed to provde protection for livestock. The shetler can be moved aroung the grazing unit in order to prevent heavy use resource concerns at any one location.

Before Situation:

Herds are held and fed in fragile riparian areas in order to reduce stress on domestic animals from harsh winter conditions and provide protection from wind. The concentration of animals in these areas degrade streambanks, cause excessive sedimentation, damage woody vegetation, overgraze herbacious vegetation, in addition to degrading water quality through manure deposition and erosion. Resouce concerns are water quality, animal health, plant productivity, health, and vigor, and inadequate shelter.

After Situation:

Portable fabricated wind shelters are utilized to provide shelter for livestock in upland grazing areas from the riparian zones. The portable shelters are moved in rotation with feeding areas thereby limiting soil disturbance and reducing the impacts of heavy use at any one location. As a result of implementing this practice, the herd can be moved out of the impacted area and water quality and vegetation health resource concerns will be addressed. A typical portable wind shelter involves a series of steel framed panels faced with corrugated metal. Each unit is approximately 9.5 feet tall and 24 feet long. Four panels (96 - feet) would be utilized to provide shelter to a herd size of 125 animals.

Feature Measure: Length of Wind Shelter

Scenario Unit: Feet

Scenario Typical Size: 96.0

Scenario Total Cost: $4,523.44

Scenario Cost/Unit: $47.12

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	16	$356.64
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	24	$818.88
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	16	$387.04
Materials						
Corrugated Steel, 22 gauge	224	Corrugated or ribbed, galvanized, 22 gauge, includes fasteners, materials only.	Square Feet	$2.82	864	$2,436.48
Drill Stem, steel, used	1393	Used drill stem typically 2-3/8" or 2-7/8" diameter. Materials only.	Feet	$1.38	380	$524.40

Practice: 576 - Livestock Shelter Structure

Scenario: #4 - Permanent Fabricated Wind Shelter, equal to or greater than 8 foot

Scenario Description:

Permanent Livestock Fabricated Wind Shelter is installed to provde protection for livestock.

Before Situation:

Herds are held and fed in fragile riparian areas in order to reduce stress on domestic animals from harsh winter conditions and provide protection from wind. The concentration of animals in these areas degrade streambanks, cause excessive sedimentation, damage woody vegetation, overgraze herbacious vegetation, in addition to degrading water quality through manure deposition and erosion. Resouce concerns are water quality, animal health, plant productivity, health, and vigor, and inadequate shelter.

After Situation:

Permanent fabricated wind shelters are installed in order to provide shelter for livestock in upland grazing areas away from the riparian zones. As a result, animals can be held in an area away from the riparian zone thereby eliminating the impacts to water quality and riparian health. A typical scenario is a Fabricated Wind Shelter installed in association with an animal feeding operation (AFO). The AFO has been moved out of the riparian zone where shelter was previously provided by the surrounding riparian woody vegetation. The AFO has been moved to a location where shelter is not naturally provided and needs to be fabricated. The typical fabrication involves a permanent, wood framed, metal or wood faced, 8.5 - foot high, 200 - foot long, fabricated wind shelter, 80% solid face, secured to the ground with wood posts.

Feature Measure: Length of Wind Shelter

Scenario Unit: Feet

Scenario Typical Size: 200.0

Scenario Total Cost: $7,488.01

Scenario Cost/Unit: $37.44

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$29.47	16	$471.52
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	16	$356.64
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	16	$387.04
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	16	$538.24
Materials						
Post, Wood, CCA treated, 6 in. x 12-14 ft.	13	Wood Post, Line/End 6 inch dia. X 12-14 ft., CCA Treated. Includes materials and shipping only.	Each	$28.91	26	$751.66
Corrugated Steel, 22 gauge	224	Corrugated or ribbed, galvanized, 22 gauge, includes fasteners, materials only.	Square Feet	$2.82	1360	$3,835.20
Dimension Lumber, Treated	1044	Treated dimension lumber with nominal thickness equal or less than 2". Includes lumber and fasteners	Board Feet	$1.14	800	$912.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 578 - Stream Crossing

Scenario: #1 - Bridge

Scenario Description:

Install a bridge to allow stream flows to cross under access road or animal trail. Bridge opening determined by sizing for storm event dictated in standard. Scenario includes dewatering, abutments, girders, decking. Work consists of site preparation, dewatering, acquiring and installing abuttments, girders, decking with necessary hardware, backfilling abuttments, and armoring with geotextile and riprap. Riprap and geotextile are used to stabilize and protect abutments as needed. Scenario based on cast in place concrete abutments, steel girders, and timber deck. Travel surface shall be wooden deck surface. If a different travel surface is needed, refer to another appropriate standard for the surfacing. Span is less than 14 feet. Load is H-20. Width is 14 feet including curbs. Abutments are <= 6 feet. Use (396) Aquatic Organism Passage instead, when the primary intent is biological concerns, not hydrologic.

Before Situation:

Water flow could not cross access road or trail without erosion; or access road or trail could not cross channel.

After Situation:

Access and waterflow are able to cross each other in a stable manner.Stream flow is not impeded and a stable base exists for equipment, people and/or animals to cross. Associated practices could be (342) Critical Area Planting, (560) Access Road, (575) Animal Trails and Walkways, (566) Recreational Trails and Walkways, (500) Obstruction Removal, or (584) Channel Stabilization.

Feature Measure: square footage of bridge deck

Scenario Unit: Square Feet

Scenario Typical Size: 252.0

Scenario Total Cost: $14,536.13

Scenario Cost/Unit: $57.68

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, dump, 12 CY	1215	Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only.	Hours	$72.63	8	$581.04
Excavation, common earth, side cast, large equipment	1227	Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$1.38	75	$103.50
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	80	$2,729.60
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	8	$269.12
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic Yards	$84.32	20	$1,686.40
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	20	$601.40
Dimension Lumber, untreated	1045	Untreated dimension lumber with nominal thickness equal or less than 2". Includes lumber and fasteners.	Board Feet	$0.95	2000	$1,900.00
Block, pre-cast concrete, modular	1496	Pre-cast concrete blocks, typically 2ft x 2ft x 6ft , includes installation and delivery.	Cubic Yards	$134.22	18	$2,415.96
Steel, structural steel members	1779	Structural steel, includes materials and fabrication.	Pound	$1.25	3000	$3,750.00
Floating Turbidity Curtain, Permeable, 4 ft.	2351	Floating permeable vinyl curtain with chain or cable weight and all necessary anchoring required for installation in flowing streams or rivers. Does not include labor for installation or removal. Includes materials and shipping only.	Feet	$13.17	20	$263.40
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 578 - Stream Crossing

Scenario: #2 - Hard armored low water crossing

Scenario Description:

Stabilize the bottom and slope of a stream channel using rock riprap or cast in place concrete. This scenario includes site preparation, dewatering, acquiring and installing gravel or geotextile with rock riprap or cast in place concrete on channel bottom and approaches. Final travel surface shall be the rocks or concrete. If a different travel surface is needed, refer to another appropriate standard for the surfacing. Typical stream has 30 foot bottom width and approaches. Width is 14 feet for a total area as 420sf. Use (396) Aquatic Organism Passage instead, when the primary intent is biological concerns, not hydrologic.

Before Situation:

Water flow could not cross access road or trail without erosion; or access road or trail could not cross channel.

After Situation:

Stream flow is not impeded and a stable base exists for equipment, people and/or animals to cross. Associated practices could be (342) Critical Area Planting, (560) Access Road, (575) Animal Trails and Walkways, (566) Recreational Trails and Walkways, (500) Obstruction Removal, or (584) Channel Stabilization.

Feature Measure: Crossing dimensions

Scenario Unit: Square Feet

Scenario Typical Size: 420.0

Scenario Total Cost: $2,254.25

Scenario Cost/Unit: $5.37

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, dump, 12 CY	1215	Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only.	Hours	$72.63	2	$145.26
Excavation, common earth, side cast, large equipment	1227	Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$1.38	18	$24.84
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	2	$67.28
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic Yards	$84.32	18	$1,517.76
Floating Turbidity Curtain, Permeable, 4 ft.	2351	Floating permeable vinyl curtain with chain or cable weight and all necessary anchoring required for installation in flowing streams or rivers. Does not include labor for installation or removal. Includes materials and shipping only.	Feet	$13.17	20	$263.40
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 578 - Stream Crossing

Scenario: #4 - Low water crossing using prefabricated products

Scenario Description:

To install a stable crossing medium on channel bottom and approatches. Medium includes but not limited to precast concrete blocks, geocells, pavers, and gabions. If a different travel surface is needed, refer to another appropriate standard for the surfacing. Typical stream has 30 foot bottom width and approaches. Width is 14 feet for a total area as 420sf. Use (396) Aquatic Organism Passage instead, when the primary intent is biological concerns, not hydrologic.

Before Situation:

Water flow could not cross access road or trail without erosion; or access road or trail could not cross channel.

After Situation:

Access road and waterflow are able to cross each other in a stable manner.Stream flow is not impeded and a stable base exists for equipment, people and/or animals to cross. Associated practices could be (342) Critical Area Planting, (560) Access Road, (575) Animal Trails and Walkways, (566) Recreational Trails and Walkways, (500) Obstruction Removal, or (584) Channel Stabilization.

Feature Measure: low water crossing

Scenario Unit: Square Feet

Scenario Typical Size: 420.0

Scenario Total Cost: $3,342.58

Scenario Cost/Unit: $7.96

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, dump, 12 CY	1215	Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only.	Hours	$72.63	2	$145.26
Excavation, common earth, side cast, large equipment	1227	Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$1.38	18	$24.84
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	40	$967.60
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	2	$67.28
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic Yards	$28.74	6	$172.44
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	18	$541.26
GeoCell, 4 inch	1054	4-inch thick cellular confinement system, three-dimensional, expandable panels made from high-density polyethylene (HDPE), polyester or another polymer material. Includes materials, labor and equipment for the geocell only, does not include backfill	Square Yard	$23.21	50	$1,160.50
Floating Turbidity Curtain, Permeable, 4 ft.	2351	Floating permeable vinyl curtain with chain or cable weight and all necessary anchoring required for installation in flowing streams or rivers. Does not include labor for installation or removal. Includes materials and shipping only.	Feet	$13.17	20	$263.40

Practice: 580 - Streambank and Shoreline Protection

Scenario: #1 - Vegetative

Scenario Description:

Protection of streambanks consisting of conventional plantings of vegetation to stabilize and protect against scour and erosion. The purpose of this practice is to maintain, improve, or restore physical, chemical, and biological functions of a stream to provide diverse aquatic communities to improve habitat for desired aquatic species. Payment cost include shaping bank, critical area vegetation and erosion control fabric; a 6-foot high bank at 3(H):1(V) slope for 1000 linear feet (0.46 acres) is used for estimation purposes. Resource Concerns: Soil Erosion - Excessive Bank Erosion from Streams, Shoreline and Water Conveyance Channels; Water Quality Degradation - Excessive Sediment in Surface Waters; Water Quality Degradation - Elevated Water Temperature; Excess/Insufficient Water - Excessive Sediment in Surface Waters; Inadequate Habitat for Fish and Wildlife- Habitat Degradation. Associated Practices include: 560 - Access Road; 342 - Critical Area Planting; 382 - Fence; 391 - Riparian Forest Buffer; 390 - Riparian Herbaceous Cover; 395 - Stream Habitat Improvement and Management; 614 - Watering Facility

Before Situation:

A stream bisects the agricultural property and has had all of the woody vegetation removed due to overgrazing or human manipulation; the stream has marginally degraded streambanks that are unstable and show signs of active erosion. Soil Erosion: The streambank is unstable. Water Quality Degradation: The sediment load has increased in the stream resulting in elevated water temperatures. Excess/Insufficient Water: The excessive sediment load has reduced the water conveyance capacity, storage capacity and flow within the stream. Inadequate Habitat for Fish and Wildlife: The deficiencies in the stream's habitat limit survival, growth, reproduction, and/or diversity of aquatic organisms within the stream.

After Situation:

The streambank is stable against further erosion and encourages natural sediment transport and deposition. Loss of riparian areas and sediment load is reduced in the stream. For Soil Erosion: The streambank is stable. For Water Quality Degradation: The sediment load has decreased in the stream resulting in improved aquatic habitat. For Excess/Insufficient Water: The water conveyance capacity, storage capacity and flow within the stream has been stabilized. For Inadequate Habitat for Fish and Wildlife: The reduction in the sediment load promotes survival, growth, reproduction, and/or diversity of aquatic organisms within the stream's habitat.

Feature Measure: Linear Feet of Streambank/Shorelin

Scenario Unit: Feet

Scenario Typical Size: 1,000.0

Scenario Total Cost: $22,215.98

Scenario Cost/Unit: $22.22

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	2500	$5,200.00
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.89	16	$814.24
Seeding Operation, Broadcast, Ground	959	Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs.	Acres	$11.06	0.46	$5.09
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	252	$6,095.88
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	16	$423.36
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	63	$2,856.42
Materials						
Erosion Control Blanket, biodegradable	1213	Biodegradable erosion control blanket, typically a composite of natural fibers with reinforcing polymer netting. Materials and shipping only.	Square Yard	$1.32	2222	$2,933.04
Annual Grasses	2730	Annual grasses, one or more species, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$32.58	100	$3,258.00
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 580 - Streambank and Shoreline Protection

Scenario: #2 - Bioengineered

Scenario Description:

Protection of streambanks consisting of a bioengineered technique comprised of non-structural measures such as earth revetments and benches with vegetative measures to stabilize and protect the streambank against scour and erosion. Soil bioengineering is a system of living plant materials used as structural components. Adapted types of woody vegetation (shrubs and trees) are initially installed in specified configurations that offer immediate soil protection and reinforcement. In addition, soil bioengineering systems create resistance to sliding or shear displacement in a streambank as they develop roots or fibrous inclusions. Environmental benefits derived from woody vegetation include diverse and productive riparian habitats, shade, organic additions to the stream, cover for fish, and improvements in aesthetic value and water quality. Under certain conditions, soil bioengineering installations work well in conjunction with structures to provide more permanent protection and healthy function, enhance aesthetics, and create a more environmentally acceptable product. Soil bioengineering systems normally use unrooted plant parts in the form of cut branches and rooted plants. For streambanks, living systems include brushmattresses, live stakes, joint plantings, vegetated geogrids, branchpacking, and live fascines. The purpose of this practice is to maintain, improve, or restore physical, chemical, and biological functions of a stream to provide diverse aquatic communities to improve habitat for desired aquatic species. Payment cost include shaping bank, critical area vegetation, livestake, rootwads and revetments: a 6-foot high bank at 3(H):1(V) slope for 1000 linear feet (0.46 acres) is used for estimation purposes. Resource Concerns: Soil Erosion - Excessive Bank Erosion from Streams, Shoreline and Water Conveyance Channels; Water Quality Degradation - Excessive Sediment in Surface Waters; Water Quality Degradation - Elevated Water Temperature; Excess/Insufficient Water - Excessive Sediment in Surface Waters; Inadequate Habitat for Fish and Wildlife- Habitat Degradation. Associated Practices include: 560 - Access Road; 342 - Critical Area Planting; 382 - Fence; 391 - Riparian Forest Buffer; 390 - Riparian Herbaceous Cover; 395 - Stream Habitat Improvement and Management; 614 - Watering Facility

Before Situation:

A stream bisects the agricultural property and has had all of the woody vegetation removed due to overgrazing or human manipulation; the stream has moderately degraded streambanks that are unstable and show signs of active erosion. Soil Erosion: The streambank is unstable. Water Quality Degradation: The sediment load has increased in the stream resulting in elevated water temperatures. Excess/Insufficient Water: The excessive sediment load has reduced the water conveyance capacity, storage capacity and flow within the stream. Inadequate Habitat for Fish and Wildlife: The deficiencies in the stream's habitat limit survival, growth, reproduction, and/or diversity of aquatic organisms within the stream.

After Situation:

The streambank is stable against further erosion and encourages natural sediment transport and deposition. Loss of riparian areas and sediment load is reduced in the stream. For Soil Erosion: The streambank is stable. For Water Quality Degradation: The sediment load has decreased in the stream resulting in improved aquatic habitat. For Excess/Insufficient Water: The water conveyance capacity, storage capacity and flow within the stream has been stabilized. For Inadequate Habitat for Fish and Wildlife: The reduction in the sediment load promotes survival, growth, reproduction, and/or diversity of aquatic organisms within the stream's habitat.

Feature Measure: Linear Feet of Streambank/Shorelin

Scenario Unit: Feet

Scenario Typical Size: 1,000.0

Scenario Total Cost: $51,254.41

Scenario Cost/Unit: $51.25

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	2500	$5,200.00
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	2500	$10,475.00
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.89	16	$814.24
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hours	$120.60	75	$9,045.00
Seeding Operation, Broadcast, Ground	959	Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs.	Acres	$11.06	0.46	$5.09
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	418	$10,111.42
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	16	$423.36
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	75	$2,523.00
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	90	$4,080.60
Materials						
Erosion Control Blanket, biodegradable	1213	Biodegradable erosion control blanket, typically a composite of natural fibers with reinforcing polymer netting. Materials and shipping only.	Square Yard	$1.32	2222	$2,933.04

Tree, Hardwood, Seedling, Medium	1510	Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only.	Each	$1.52	1000	$1,520.00
Annual Grasses	2730	Annual grasses, one or more species, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$32.58	100	$3,258.00
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	3	$707.13

Practice: 580 - Streambank and Shoreline Protection

Scenario: #3 - Structural

Scenario Description:

Protection of streambanks using structural measures such as riprap, concrete block, gabions, etc. to stabilize and protect banks of streams or excavated channels against scour and erosion. Additional structural measures may also include tree revetments; log, rootwad and boulder revetments; dormant post plantings; piling revetments with wire or geotextile fencing; piling revetments with slotted fencing; jacks or jack fields; rock riprap; stream jetties; stream barbs; and gabions. The purpose of this practice is to maintain, improve, or restore physical, chemical, and biological functions of a stream to provide diverse aquatic communities to improve habitat for desired aquatic species. Payment cost include shaping bank, critical area vegetation, geotextile, and rock rip rap; a 6-foot high bank at 3(H):1(V) slope for 1000 linear feet (0.46 acres) is used for estimation purposes. The rock toe will be 3' thick and 5' high. The bank above the riprap will be graded to a stable slope and revegetated. Resource Concerns: Soil Erosion - Excessive Bank Erosion from Streams, Shoreline and Water Conveyance Channels; Water Quality Degradation - Excessive Sediment in Surface Waters; Water Quality Degradation - Elevated Water Temperature; Excess/Insufficient Water - Excessive Sediment in Surface Waters; Inadequate Habitat for Fish and Wildlife- Habitat Degradation. Associated Practices include: 560 - Access Road; 342 - Critical Area Planting; 382 - Fence; 391 - Riparian Forest Buffer; 390 - Riparian Herbaceous Cover; 395 - Stream Habitat Improvement and Management; 614 - Watering Facility

Before Situation:

A stream bisects the agricultural property and has had all of the woody vegetation removed due to overgrazing or human manipulation; the stream has severely degraded streambanks that are unstable and show signs of active erosion. Soil Erosion: The streambank is unstable. Water Quality Degradation: The sediment load has increased in the stream resulting in elevated water temperatures. Excess/Insufficient Water: The excessive sediment load has reduced the water conveyance capacity, storage capacity and flow within the stream. Inadequate Habitat for Fish and Wildlife: The deficiencies in the stream's habitat limit survival, growth, reproduction, and/or diversity of aquatic organisms within the stream.

After Situation:

The streambank is stable against further erosion and encourages natural sediment transport and deposition. Loss of riparian areas and sediment load is reduced in the stream. For Soil Erosion: The streambank is stable. For Water Quality Degradation: The sediment load has decreased in the stream resulting in improved aquatic habitat. For Excess/Insufficient Water: The water conveyance capacity, storage capacity and flow within the stream has been stabilized. For Inadequate Habitat for Fish and Wildlife: The reduction in the sediment load promotes survival, growth, reproduction, and/or diversity of aquatic organisms within the stream's habitat.

Feature Measure: Linear Feet of Streambank/Shorelin

Scenario Unit: Feet

Scenario Typical Size: 1,000.0

Scenario Total Cost: $177,757.06

Scenario Cost/Unit: $177.76

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	2500	$10,475.00
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.89	16	$814.24
Seeding Operation, Broadcast, Ground	959	Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs.	Acres	$11.06	0.12	$1.33
Excavation, common earth, wet, side cast, large equipment	1228	Bulk excavation and side casting of wet common earth with hydraulic excavator or dragline with greater than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$4.12	2500	$10,300.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	360	$8,708.40
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	16	$423.36
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	90	$4,080.60
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic Yards	$84.32	1667	$140,561.44
Erosion Control Blanket, biodegradable	1213	Biodegradable erosion control blanket, typically a composite of natural fibers with reinforcing polymer netting. Materials and shipping only.	Square Yard	$1.32	556	$733.92
Annual Grasses	2730	Annual grasses, one or more species, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$32.58	25	$814.50
Mobilization						

Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	1	$450.03

Practice: 580 - Streambank and Shoreline Protection

Scenario: #13 - Toe Wood

Scenario Description:

: Protection of streambanks consisting of the installation of root wads, tree trunks, branch packings, live branches with conventional plantings of vegetation to stabilize and protect against scour and erosion. The purpose of this practice is to maintain, improve, or restore physical, chemical, and biological functions of a stream to provide diverse aquatic communities to improve habitat for desired aquatic species. Payment cost include shaping bank, critical area vegetation and wood components consisting of root wads, tree trunks,and an assortment of live branches; a 6-foot high bank at 3(H):1(V) slope for 1000 linear feet (20,038 sq feet) is used for estimation purposes (area computed perpendicular to face of treated bank). Resource Concerns: Soil Erosion - Excessive Bank Erosion from Streams, Shoreline and Water Conveyance Channels; Water Quality Degradation - Excessive Sediment in Surface Waters; Water Quality Degradation - Elevated Water Temperature; Excess/Insufficient Water - Excessive Sediment in Surface Waters; Inadequate Habitat for Fish and Wildlife- Habitat Degradation. Associated Practices include: 560 - Access Road; 342 - Critical Area Planting; 382 - Fence; 391 - Riparian Forest Buffer; 390 - Riparian Herbaceous Cover; 395 - Stream Habitat Improvement and Management; 614 - Watering Facility; 484-Mulching; 570-Stormwater Runoff Control.

Before Situation:

A stream bisects the agricultural property and has had all of the woody vegetation removed due to overgrazing or human manipulation; the stream has marginally degraded streambanks that are unstable and show signs of active erosion. Soil Erosion: The streambank is unstable. Water Quality Degradation: The sediment load has increased in the stream resulting in elevated water temperatures. Excess/Insufficient Water: The excessive sediment load has reduced the water conveyance capacity, storage capacity and flow within the stream. Inadequate Habitat for Fish and Wildlife: The deficiencies in the stream's habitat limit survival, growth, reproduction, and/or diversity of aquatic organisms within the stream.

After Situation:

The streambank is stable against further erosion and encourages natural sediment transport and deposition. Loss of riparian areas and sediment load is reduced in the stream. For Soil Erosion: The streambank is stable. For Water Quality Degradation: The sediment load has decreased in the stream resulting in improved aquatic habitat. For Excess/Insufficient Water: The water conveyance capacity, storage capacity and flow within the stream has been stabilized. For Inadequate Habitat for Fish and Wildlife: The reduction in the sediment load promotes survival, growth, reproduction, and/or diversity of aquatic organisms within the stream's habitat.

Feature Measure: Area of protection installed

Scenario Unit: Square Feet

Scenario Typical Size: 20,038.0

Scenario Total Cost: $70,330.62

Scenario Cost/Unit: $3.51

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$29.47	16	$471.52
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$100.83	112	$11,292.96
Seeding Operation, Broadcast, Ground	959	Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs.	Acres	$11.06	0.46	$5.09
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	672	$16,255.68
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	16	$423.36
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	56	$2,539.04
Materials						
Tree & Shrub, Woody, Cuttings, Large	1309	Woody pole cuttings or posts 2 to 6 inches in diameter and 6 ft. long. Includes materials and shipping only.	Each	$14.97	1000	$14,970.00
Tree, Hardwood, Seedling, Medium	1510	Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only.	Each	$1.52	6000	$9,120.00
Log, un-anchored	2035	Price of log picked up at the Mill. Includes material only.	Ton	$163.19	82.7	$13,495.81
Root Wad	2045	Tree stump buried into the streambank with the roots left exposed. Includes material only.	Ton	$10.02	111	$1,112.22
Annual Grasses	2730	Annual grasses, one or more species, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$32.58	0.46	$14.99
Mobilization						

Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 582 - Open Channel

Scenario: #1 - excavation, normal conditions

Scenario Description:

This scenario is the construction or improvement of a channel in which water flows with a free surface. Typical construction dimensions are 6' deep x 15' wide bottom x 100' length with a side slope of 2.5:1. The practice is used for the restoration of a natural or artificial channel to improve the process and ecological function in a degraded and eroding stream. Conditions are normal. Normal conditions include: a location easily accessible from a main road, soils without large rock or difficult clay to excavate, and/or other aspects that are average compared to excavation work in the area.This scenario assists in addressing the resource concerns: streambank erosion, sediment deposition, excessive flooding or ponding. Conservation practices that may be associated are: 356-Dike, 587-Structure For Water Control, 533-Pumping Plant, 580 Streambank and Shoreline Protection, 584 Channel Stabilization, 578 Stream Crossing.

Before Situation:

A stream or channel with active streambank erosion or headcuts and inadequate capacity to handle the flow needed for flood prevention, drainage or erosion prevention.

After Situation:

An earthen channel was excavated to allow unrestricted flow of water and to stabilize the bottom and side slopes. Flooding and erosion is no longer a resource concern.

Feature Measure: Volume of earth excavated in CY's

Scenario Unit: Cubic Yards

Scenario Typical Size: 500.0

Scenario Total Cost: $1,275.71

Scenario Cost/Unit: $2.55

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	500	$1,040.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 582 - Open Channel

Scenario: #2 - excavation, difficult conditions

Scenario Description:

This scenario is the construction or improvement of a channel in which water flows with a free surface. Typical construction dimensions are 6' deep x 15' wide bottom x 100' length with a side slope of 2.5:1. The practice is used for the restoration of a natural or artificial channel to improve the process and ecological function in a degraded and eroding stream. Conditions are difficult. Difficult conditions include: a location that requires a significant drive off the main road, soils with large rock or difficult clay to excavate, and/or other aspects that create difficulty in excavation compared to similar work in the area. Construction may include vegetation and/or a lightly armored bank toe. This scenario assists in addressing the resource concerns: streambank erosion, sediment deposition, excessive flooding or ponding. Conservation practices that may be associated are: 356-Dike, 587-Structure For Water Control, 533-Pumping Plant, 580 Streambank and Shoreline Protection, 584 Channel Stabilization, 578 Stream Crossing.

Before Situation:

A stream or channel with active streambank erosion or headcuts and inadequate capacity to handle the flow needed for flood prevention, drainage or erosion prevention.

After Situation:

An earthen channel was excavated to allow unrestricted flow of water and to stabilize the bottom and side slopes. Flooding and erosion is no longer a resource concern.

Feature Measure: Volume of earth excavated in CY's

Scenario Unit: Cubic Yards

Scenario Typical Size: 500.0

Scenario Total Cost: $1,831.95

Scenario Cost/Unit: $3.66

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	500	$1,040.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	8	$193.52
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	8	$362.72
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 582 - Open Channel

Scenario: #3 - excavation and fill, normal conditions

Scenario Description:

This scenario is the construction or improvement of a channel in which water flows with a free surface. Typical construction dimensions are 6' deep x 15' wide bottom x 100' length with a side slope of 2.5:1. Excavation and earth fill is required. The practice is used for the restoration of a natural or artificial channel to improve the process and ecological function in a degraded and eroding stream. Conditions are normal. Normal conditions include: a location easily accessible from a main road, soils without large rock or difficult clay to excavate, and/or other aspects that are average compared to excavation work in the area. This scenario assists in addressing the resource concerns: streambank erosion, sediment deposition, excessive flooding or ponding. Conservation practices that may be associated are: 356-Dike, 587-Structure For Water Control, 533-Pumping Plant, 580 Streambank and Shoreline Protection, 584 Channel Stabilization, 578 Stream Crossing.

Before Situation:

A stream or channel with active streambank erosion or headcuts and inadequate capacity to handle the flow needed for flood prevention, drainage or erosion prevention.

After Situation:

An earthen channel was excavated to allow unrestricted flow of water and to stabilize the bottom and side slopes. Some fill was used to complete the channel shape. Flooding and erosion is no longer a resource concern.

Feature Measure: Volume of earth excavated in CY's

Scenario Unit: Cubic Yards

Scenario Typical Size: 500.0

Scenario Total Cost: $3,370.71

Scenario Cost/Unit: $6.74

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	500	$1,040.00
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	500	$2,095.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 582 - Open Channel

Scenario: #4 - excavation and fill, difficult conditions

Scenario Description:

This scenario is the construction or improvement of a channel in which water flows with a free surface. Typical construction dimensions are 6' deep x 15' wide bottom x 100' length with a side slope of 2.5:1. The practice is used for the restoration of a natural or artificial channel to improve the process and ecological function in a degraded and eroding stream. Excavation and earth fill is required. Conditions are difficult. Difficult conditions include: a location that requires a significant drive off the main road, soils with large rock or difficult clay to excavate, and/or other aspects that create difficulty in excavation compared to similar work in the area. Construction may include vegetation and/or a lightly armored bank toe. This scenario assists in addressing the resource concerns: streambank erosion, sediment deposition, excessive flooding or ponding. Conservation practices that may be associated are: 356-Dike, 587-Structure For Water Control, 533-Pumping Plant, 580 Streambank and Shoreline Protection, 584 Channel Stabilization, 578 Stream Crossing.

Before Situation:

A stream or channel with active streambank erosion or headcuts and inadequate capacity to handle the flow needed for flood prevention, drainage or erosion prevention.

After Situation:

An earthen channel was excavated to allow unrestricted flow of water and to stabilize the bottom and side slopes. Some fill was used to complete the channel shape. Flooding and erosion is no longer a resource concern.

Feature Measure: Volume of earth excavated in CY's

Scenario Unit: Cubic Yards

Scenario Typical Size: 500.0

Scenario Total Cost: $3,926.95

Scenario Cost/Unit: $7.85

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	500	$1,040.00
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	500	$2,095.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	8	$193.52
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	8	$362.72
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 584 - Channel Bed Stabilization

Scenario: #1 - Bio-engineering

Scenario Description:

Stabilize the bottom and slope of a stream channel using bioengineering methods. Bio-engineering methods include live stakes, fascines, plantings, bare root stock, willow waddles, and live stakes. Re-vegetation of exposed surfaces will be completed using 342 - Critical Area Planting. Typical stream has 50 foot bottom width and 6 foot banks. Length of area 100 feet. Planting entire area at a 2x2 grid with live stakes, potted plants, and bare root mix

Before Situation:

Bed of an existing or newly constructed alluvial or threshold channel is undergoing damaging aggradation or degradation. Stream cannot be feasibly controlled with clearing and snagging, vegetation, bank protection or upstream water control. Soil Erosion: The stream is unstable. Water Quality Degradation: The sediment load has increased in the stream resulting in elevated water temperatures. Excess/Insufficient Water: The excessive sediment load has reduced the water conveyance capacity, storage capacity and flow within the stream. Inadequate Habitat for Fish and Wildlife: The deficiencies in the stream's habitat limit survival, growth, reproduction, and/or diversity of aquatic organisms within the stream.

After Situation:

Stream channel is stable and vegetated. Other associated practices could be (326) Clearing and Snagging, (396) Aquatic Organism Passage, (395) Stream Habitat Improvement and Management, (580) Streambank and Shoreline Protection, or (587) Structure for Water Control. For Soil Erosion: The streambank is stable. For Water Quality Degradation: The sediment load has decreased in the stream resulting in improved aquatic habitat. For Excess/Insufficient Water: The water conveyance capacity, storage capacity and flow within the stream has been stabilized. For Inadequate Habitat for Fish and Wildlife: The reduction in the sediment load promotes survival, growth, reproduction, and/or diversity of aquatic organisms within the stream's habitat.

Feature Measure: Area of planting

Scenario Unit: Square Feet

Scenario Typical Size: 2,500.0

Scenario Total Cost: $11,658.80

Scenario Cost/Unit: $4.66

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$21.30	40	$852.00
Stripping and stockpiling, topsoil	1199	Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor.	Cubic Yards	$0.87	200	$174.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	120	$2,902.80
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	40	$1,058.40
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	40	$1,813.60
Materials						
Erosion Control Blanket, biodegradable	1213	Biodegradable erosion control blanket, typically a composite of natural fibers with reinforcing polymer netting. Materials and shipping only.	Square Yard	$1.32	800	$1,056.00
Tree, Hardwood, Seedling, Medium	1510	Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only.	Each	$1.52	1500	$2,280.00
Wattles or facines, 6 to 8 inch diameter	1904	Facines, or wattles: bundles of live tree stems of species that sprout roots, bound together. 6"-8" diameter. Includes materials and shipping only.	Feet	$7.61	200	$1,522.00

Practice: 584 - Channel Bed Stabilization

Scenario: #2 - Rock structures

Scenario Description:

Stabilize the bottom and slope of a stream channel using rock riprap or engineered products that consist primarily of rock or concrete. This includes but not limited to gabions, rock veins, rock weirs, concrete blocks,etc. Typical stream has 50 foot bottom width and 6 foot banks. Length of area 100 feet. Based on degrading channel that needs to be riprapped its entire wetted perimeter.

Before Situation:

Bed of an existing or newly constructed alluvial or threshold channel is undergoing damaging aggradation or degradation. Changes cannot be controlled feasibly with clearing and snagging, vegetation, bank protection or upstream water control. Soil Erosion: The stream is unstable. Water Quality Degradation: The sediment load has increased in the stream resulting in elevated water temperatures. Excess/Insufficient Water: The excessive sediment load has reduced the water conveyance capacity, storage capacity and flow within the stream. Inadequate Habitat for Fish and Wildlife: The deficiencies in the stream's habitat limit survival, growth, reproduction, and/or diversity of aquatic organisms within the stream.

After Situation:

Stream channel is stable. Re-vegetation of exposed surfaces will be completed using 342 - Critical Area Planting. Other associated practices could be (326) Clearing and Snagging, (396) Aquatic Organism Passage, (395) Stream Habitat Improvement and Management, (580) Streambank and Shoreline Protection, or (587) Structure for Water Control. For Soil Erosion: The streambank is stable. For Water Quality Degradation: The sediment load has decreased in the stream resulting in improved aquatic habitat. For Excess/Insufficient Water: The water conveyance capacity, storage capacity and flow within the stream has been stabilized. For Inadequate Habitat for Fish and Wildlife: The reduction in the sediment load promotes survival, growth, reproduction, and/or diversity of aquatic organisms within the stream's habitat.

Feature Measure: Area to be stabilized.

Scenario Unit: Cubic Yards

Scenario Typical Size: 575.0

Scenario Total Cost: $51,680.54

Scenario Cost/Unit: $89.88

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Clearing and Grubbing	40	Clearing and Grubbing, includes materials, equipment and labor	Acres	$325.13	0.2	$65.03
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	20	$483.80
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic Yards	$84.32	600	$50,592.00
Tree, Hardwood, Seedling, Medium	1510	Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only.	Each	$1.52	200	$304.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 584 - Channel Bed Stabilization

Scenario: #3 - Wood structures

Scenario Description:

Stabilize the bottom and slope of a stream channel using engineered structures consisting primarily of wood. This includes but not limited to toe wood, log weirs, log vanes, root wads, log step pools, etc. Re-vegetation of exposed surfaces will be completed using 342 - Critical Area Planting. Typical stream has 50 foot bottom width and 6 foot banks. Length of area 100 feet. Structures spaced at 50 foot intervals.

Before Situation:

Bed of an existing or newly constructed alluvial or threshold channel is undergoing damaging aggradation or degradation. Changes cannot be controlled feasibly with clearing and snagging, vegetation, bank protection or upstream water control. Soil Erosion: The stream is unstable. Water Quality Degradation: The sediment load has increased in the stream resulting in elevated water temperatures. Excess/Insufficient Water: The excessive sediment load has reduced the water conveyance capacity, storage capacity and flow within the stream. Inadequate Habitat for Fish and Wildlife: The deficiencies in the stream's habitat limit survival, growth, reproduction, and/or diversity of aquatic organisms within the stream.

After Situation:

Stream channel is stable. Re-vegetation of exposed surfaces will be completed using 342 - Critical Area Planting. Other associated practices could be (326) Clearing and Snagging, (396) Aquatic Organism Passage, (395) Stream Habitat Improvement and Management, (580) Streambank and Shoreline Protection, or (587) Structure for Water Control. For Soil Erosion: The streambank is stable. For Water Quality Degradation: The sediment load has decreased in the stream resulting in improved aquatic habitat. For Excess/Insufficient Water: The water conveyance capacity, storage capacity and flow within the stream has been stabilized. For Inadequate Habitat for Fish and Wildlife: The reduction in the sediment load promotes survival, growth, reproduction, and/or diversity of aquatic organisms within the stream's habitat.

Feature Measure: Number of structures

Scenario Unit: Each

Scenario Typical Size: 3.0

Scenario Total Cost: $9,194.30

Scenario Cost/Unit: $3,064.77

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	40	$83.20
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	40	$967.60
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic Yards	$84.32	75	$6,324.00
Wattles or facines, 9 to 12 inch diameter	1905	Facines, or wattles: bundles of live tree stems of species that sprout roots, bound together. 9"- 12" diameter. Includes materials and shipping only.	Feet	$12.13	150	$1,819.50

Practice: 585 - Stripcropping

Scenario: #1 - Stripcropping - wind and water erosion

Scenario Description:

This scenario describes the implementation of a strip cropping system that is designed specifically for the control of wind and water erosion or minimizing the transport of sediments or other water borne contaminants originating from runoff on cropland. The planned strip cropping system will meet the current 585 standard. Implementation will result in alternating strips of erosion susceptible crops with erosion resistant crops that are oriented as close to perpendicular to water flows as possible. The designed system will reduce erosion/sediment/contaminants to desired objectives. The scenario includes the costs of designing the system, installing the strips on the landscape appropriately, and integrating a crop rotation that includes water erosion resistant species.

Before Situation:

In this geographic area, excessive water erosion is caused by raising crops in a manner that allows sheet water flows to travel down the slope causing sheet and rill erosion or concentrated flow conditions, degradation of soil health through loss of topsoil and organic matter, along with offsite negative impacts to water quality and aquatic wildlife habitat.

After Situation:

A strip cropping system that includes at least two or more strips within the planning slope will be designed to include parallel strips of approximately equal widths of water erosion resistant crop species with non-water erosion resistant crop species. Widths will be determined using current water erosion prediction technology to meet objectives. The design and implementation of a stripcropping system will minimize wind, sheet and rill erosion, protect soil quality, reduce offsite sedimentation, and benefit offsite aquatic wildlife habitat. Erosion prediction before and after practice application will be recorded showing the design and benefits of the practice. Erosion resistant strips in rotation must be managed to maintain the planned vegetative cover and surface roughness.

Feature Measure: area of strips

Scenario Unit: Acres

Scenario Typical Size: 80.0

Scenario Total Cost: $139.44

Scenario Cost/Unit: $1.74

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	3	$66.87
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	3	$72.57

Practice: 587 - Structure for Water Control

Scenario: #1 - Inlet Flashboard Riser, Metal

Scenario Description:

A Flashboard Riser fabricated of metal and used in a water management system that maintains a desired water surface elevation, controls the direction or rate of flow, or conveys water to address the resource concerns: Inadequate Water - Inefficient use of Irrigation Water and Inadequate habitat for Fish and Wildlife. The water surface elevation is controlled by addition or removal of slats or "stoplogs". This scenario is applicable to variable crest weir structures where the elevation is controlled at the inlet (Half-Rounds). They are often fabricated from half pipes (i.e. half-rounds) or sheet steel in a box shape. Payment rate is based upon the Flashboard Weir Length in inches multiplied by the outlet length in feet (Inch-Foot). Cost estimate is based on a "Half-Round" flashboard riser shop fabricated using a longitudinal cut 36" smooth steel pipe, a 50' long - 30" outlet pipe passing through an embankment.

Before Situation:

The operator presently flood irrigates his field and has no means to accurately maintain a constant water level at varying elevations resulting in a lack of flexibility, and inefficient use of water and energy during pumping. The operator also desires to maintain a permanent pool for water fowl during the winter.

After Situation:

The operator has the capability to more efficiently control and maintain a range of water surface elevations thereby reducing the flow rate needed. Less water is wasted and both water and energy is conserved. The operator is now able to maintain adequate water during the winter as a benefit to waterfowl. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Irrigation Water Management (449), Irrigation Land Leveling (464), Irrigation Canal or Lateral (320), Irrigation System, Tailwater Recovery (447), Dike (356), and Grade Stabilization Structure (410) will use the corresponding Standard(s) as appropriate.

Feature Measure: Flashboard Weir Length (in) x barre

Scenario Unit: Inch-Foot

Scenario Typical Size: 1,800.0

Scenario Total Cost: $7,424.34

Scenario Cost/Unit: $4.12

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	190	$796.10
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$5.40	10	$54.00
Hydraulic Excavator, .5 CY	930	Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included.	Hours	$57.32	2	$114.64
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	5	$170.60
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	6	$145.14
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	2	$67.28
Materials						
Pipe, Steel, 30 in., Std Wt, USED	1361	Materials: - USED - 30 inch - Steel Std Wt	Feet	$95.23	50	$4,761.50
Pipe, Steel, 36 in., Std Wt, USED	1362	Materials: - USED - 36 inch - Steel Std Wt	Feet	$134.72	6	$808.32
Steel, Angle, 2 1/2 in. x 2 1/2 in. x 1/4 in.	1372	Materials: Angle, 2 1/2 inch x 2 1/2 inch x 1/4 inch. Meets ASTM A36	Feet	$3.95	24	$94.80
Steel, Plate, 3/8 in.	1375	Flat steel plate, 3/8 inch thickness. Materials only.	Square Feet	$12.03	4	$48.12
Lumber, planks, posts and timbers, treated	1609	Treated dimension lumber with nominal thickness greater than 2". Includes lumber and fasteners. Does not include labor.	Board Feet	$1.97	32	$63.04
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	1	$65.09
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 587 - Structure for Water Control

Scenario: #2 - Inline Flashboard Riser, Metal

Scenario Description:

A Flashboard Riser fabricated of metal and used in a water management system that maintains a desired water surface elevation, controls the direction or rate of flow, or conveys water to address the resource concerns: Inadequate Water - Inefficient use of Irrigation Water and Inadequate habitat for Fish and Wildlife. The water surface elevation is controlled by addition or removal of slats or "stoplogs". This scenario is applicable to variable crest weir structures where the elevation is controlled at the embankment. They are often fabricated from vertical pipes with the stoplogs are located in the middle (i.e. Full-Rounds) or sheet steel in a box shape. Payment rate is based upon the Flashboard Weir Length in inches multiplied by the outlet length in feet (Inch-Foot). Cost estimate is based on a "Half-Round" flashboard riser shop fabricated using a longitudinal cut 36" smooth steel pipe, a 50' long - 30" outlet pipe passing through an embankment.

Before Situation:

The operator presently flood irrigates his field and has no means to accurately maintain a constant water level at varying elevations resulting in a lack of flexibility, and inefficient use of water and energy during pumping. The operator also desires to maintain a permanent pool for water fowl during the winter.

After Situation:

The operator has the capability to more efficiently control and maintain a range of water surface elevations thereby reducing the flow rate needed. Less water is wasted and both water and energy is conserved. The operator is now able to maintain adequate water during the winter as a benefit to waterfowl. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Irrigation Water Management (449), Irrigation Land Leveling (464), Irrigation Canal or Lateral (320), Irrigation System, Tailwater Recovery (447), Dike (356), and Grade Stabilization Structure (410) will use the corresponding Standard(s) as appropriate.

Feature Measure: Flashboard Weir Length (in) x Barre

Scenario Unit: Inch-Foot

Scenario Typical Size: 1,800.0

Scenario Total Cost: $7,815.28

Scenario Cost/Unit: $4.34

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	190	$796.10
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$5.40	15	$81.00
Hydraulic Excavator, .5 CY	930	Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included.	Hours	$57.32	4	$229.28
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	7	$238.84
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	10	$241.90
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	4	$134.56
Materials						
Pipe, Steel, 30 in., Std Wt, USED	1361	Materials: - USED - 30 inch - Steel Std Wt	Feet	$95.23	50	$4,761.50
Pipe, Steel, 36 in., Std Wt, USED	1362	Materials: - USED - 36 inch - Steel Std Wt	Feet	$134.72	6	$808.32
Steel, Angle, 2 1/2 in. x 2 1/2 in. x 1/4 in.	1372	Materials: Angle, 2 1/2 inch x 2 1/2 inch x 1/4 inch. Meets ASTM A36	Feet	$3.95	24	$94.80
Steel, Plate, 3/8 in.	1375	Flat steel plate, 3/8 inch thickness. Materials only.	Square Feet	$12.03	10	$120.30
Lumber, planks, posts and timbers, treated	1609	Treated dimension lumber with nominal thickness greater than 2". Includes lumber and fasteners. Does not include labor.	Board Feet	$1.97	4	$7.88
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	1	$65.09
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 587 - Structure for Water Control

Scenario: #3 - Commercial Inline Flashboard Riser

Scenario Description:

An Inline Water Control Structure (WCS) composed of plastic that maintains a desired water surface elevation, controls the direction or rate of flow, or conveys water to address the resource concern: Inadequate habitat for Fish and Wildlife. The water surface elevation is controlled by addition or removal of slats or "stoplogs". This scenario is applicable to variable crest weir structures where the elevation is controlled at point along a pipe extending through an embankment, providing ease of access to the structure and provide better protection against beaver activity. There are commercially available models composed of plastic that are commonly used when the width of the is 24" or less. Payment rate is based upon the Flashboard Weir Length in inches multiplied by the outlet length in feet (Inch-Foot). Cost estimate is based on a using a such a commercial product. The typical scenario is an inline structure with a width of 20", height of six feet, The pipe is 50' of 15" SCH 40 PVC (inlet and outlet combined).

Before Situation:

The landowner wishes to provide for a way to control the water surface elevation in a wetland area. The landowner wishes to enhance and enlarge the area to provide habitat for fish and wildlife.

After Situation:

A WCS is installed in a flow line allowing shallow water impoundments. A wetland area is enhanced and water levels can be varied to better accommodate wildlife needs. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Wetland Creation (658), Wetland Enhancement (659) Wetland Wildlife Habitat Management (644), Dike (356), and Grade Stabilization Structure (410) will use the corresponding Standard(s) as appropriate.

Feature Measure: Flashboard Weir Length (in) x Barre

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $6,321.22

Scenario Cost/Unit: $6,321.22

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	190	$796.10
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$5.40	15	$81.00
Hydraulic Excavator, .5 CY	930	Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included.	Hours	$57.32	2	$114.64
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	3	$102.36
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	8	$193.52
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	2	$67.28
Materials						
Pipe, PVC, 16 in., SCH 80	1353	Materials: - 16 inch - PVC - SCH 80 - ASTM D1785	Feet	$57.41	50	$2,870.50
Water Control Structure, Stoplog, Inline, fixed costs portion	2145	Fixed cost portion of Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Fixed cost portion. Materials only.	Each	$310.62	1	$310.62
Water Control Structure, Stoplog, Inline, variable cost portion	2146	Variable cost portion of a Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Calculate total variable costs by multiplying by the structure height x pipe diameter. Materials only.	Height x Diameter	$12.37	120	$1,484.40
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	1	$65.09
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 587 - Structure for Water Control

Scenario: #4 - Culvert <30 inches HDPE

Scenario Description:

Install a new HDPE culvert under 30 inches in diameter to convey water under roads or other barriers. A typical scenario would be an 24 inch diameter pipe, 40 feet in length. Work includes site preparation, acquiring and installing culvert pipe with gravel bedding and fill (compacted), and riprap protection of side slopes. Use (396) Aquatic Organism Passage when the primary intent is biological concerns, not hydrologic. Use (578) Stream Crossing for culverts ≥ 30 inches or perennial flow.

Before Situation:

Water flow needs to be conveyed under an access road, ditch or other barrier. Water must be conveyed in a controlled fashion.

After Situation:

Water is conveyed in a controlled manner. Associated practices could be Access Road (560), Animal Trails and Walkways (575), Critical Area Planting (342), Drainage Water Management (554), Irrigation Canal or Lateral (320), Irrigation Pipeline (430), Irrigation Reservoir (436), Irrigation System, Surface and Subsurface (443), Irrigation System, Tailwater Recovery (447), Irrigation Water Management (449), Lined Waterway or Outlet (468), Obstruction Removal (500), Pond (378), Stormwater Runoff Control (570), Surface Drain, Field Ditch (607), Surface Drain, Main or Lateral (608), and Trails and Walkways (568).

Feature Measure: Pipe Diameter (In) x Pipe Length (Ft

Scenario Unit: Inch-Foot

Scenario Typical Size: 960.0

Scenario Total Cost: $2,479.31

Scenario Cost/Unit: $2.58

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	5	$10.40
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$5.40	45	$243.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	10	$241.90
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic Yards	$84.32	2	$168.64
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	5	$150.35
Pipe, HDPE, CPT, Double Wall, Soil Tight, 24 in.	1246	Pipe, Corrugated HDPE Double Wall, 24 inch diameter with soil tight joints - AASHTO M294. Material cost only.	Feet	$29.84	40	$1,193.60
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 587 - Structure for Water Control

Scenario: #5 - Culvert <30 inches CMP

Scenario Description:

Install a new Corrugated Metal Pipe (CMP) culvert under 30 inches in diameter to convey water under roads or other barriers. A typical scenario would be an 24 inch diameter pipe, 40 feet in length. Work includes site preparation, acquiring and installing culvert pipe with gravel bedding and fill (compacted), and riprap protection of side slopes. Use (396) Aquatic Organism Passage when the primary intent is biological concerns, not hydrologic. Use (578) Stream Crossing instead for culverts ≥ 30 inches or perennial flow.

Before Situation:

Water flow needs to be conveyed under an access road, ditch or other barrier. Water must be conveyed in a controlled fashion.

After Situation:

Water is conveyed in a controlled manner. Associated practices could be Access Road (560), Animal Trails and Walkways (575), Critical Area Planting (342), Drainage Water Management (554), Irrigation Canal or Lateral (320), Irrigation Pipeline (430), Irrigation Reservoir (436), Irrigation System, Surface and Subsurface (443), Irrigation System, Tailwater Recovery (447), Irrigation Water Management (449), Lined Waterway or Outlet (468), Obstruction Removal (500), Pond (378), Stormwater Runoff Control (570), Surface Drain, Field Ditch (607), Surface Drain, Main or Lateral (608), and Trails and Walkways (568).

Feature Measure: Pipe Diameter (In) x Pipe Length (Ft

Scenario Unit: Inch-Foot

Scenario Typical Size: 960.0

Scenario Total Cost: $2,849.71

Scenario Cost/Unit: $2.97

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	5	$10.40
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$5.40	45	$243.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	10	$241.90
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic Yards	$84.32	2	$168.64
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	5	$150.35
Pipe, CMP, 24 in., 12 Gauge	1417	24 inch Corrugated Metal Pipe, Galvanized, Uncoated, 12 gage. Material cost only.	Feet	$39.10	40	$1,564.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 587 - Structure for Water Control

Scenario: #6 - Slide Gate

Scenario Description:

This scenario is the installation of a permanent slide gate structure to control the conveyance of water. The typical size is a 10" diameter opening. The slide gate may be installed on an open channel or pipeline. The slide gate is made of steel and has a hand operated mechanical lifting system. This scenario assists in addressing the resource concerns: water management. Conservation practices that may be associated are: 533-Pumping Plant.

Before Situation:

A channel or pipeline is in need of a head gate to control the flow of water.

After Situation:

A 10" hand operated slide gate is installed.

Feature Measure: width

Scenario Unit: Inch

Scenario Typical Size: 10.0

Scenario Total Cost: $155.00

Scenario Cost/Unit: $15.50

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Materials						
Slide gate, steel, 1' diameter, low head	1830	1' diameter steel slide gate for low head installations	Each	$155.00	1	$155.00

Practice: 587 - Structure for Water Control

Scenario: #7 - Rock Checks for Water Surface Profile

Scenario Description:

Typical setting is in a stream that has at minimum unstable banks, limited fish habitat, degraded bed, or any combination of the undesirable features.. Typical installation consists of installing a cross vane shaped rock structures with points facing upstream for the purpose of raising the water surface profile, stabilizing the stream bed, or creating fish habitat, and, or installing rock structures along the banks to provide bank stability and/or fish habitat. Cost estimate is for three check dams with a top width of 3', max height of 6', min height of 3', and 28' length; containing an average of 58 cubic yards or 29 tons of rock for a total of 87 tons. The check dams are underlain with geotextile fabric. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as water quality degradation and soil erosion-concentrated flow erosion.

Before Situation:

The stream presently is incised with near vertical banks caused by bank toe erosion and sloughing. This condition has caused the floodplains to be disconnected from the stream, with only floods well above normal high-water escaping the high banks of the stream.

After Situation:

Banks are stabilized, and pools are created raising the Water Surface Profile elevation and effectively reducing the slope. Riffle pool scheme is restored and banks are protected. Water quality is protected downstream due to erosion protection, and wetland features are restored in the floodplain. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Streambank and Shoreline Protection (580), Channel Bed Stabilization (584), Stream Habitat Improvement and Management (395), and Wetland Wildlife Habitat Management (644) will use the corresponding Standard(s) as appropriate.

Feature Measure: Tons of rock installed

Scenario Unit: Ton

Scenario Typical Size: 87.0

Scenario Total Cost: $8,661.39

Scenario Cost/Unit: $99.56

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, common earth, wet, side cast, large equipment	1228	Bulk excavation and side casting of wet common earth with hydraulic excavator or dragline with greater than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$4.12	85	$350.20
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	12	$290.28
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	12	$403.68
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic Yards	$84.32	85	$7,167.20
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	1	$450.03

Practice: 587 - Structure for Water Control

Scenario: #8 - Screw - Flap Gate

Scenario Description:
This senario is the installation of a water tight screw gate to control water involving a variety of water control structures. Cost includes all labor and materials needed to install gate onto a pipe or water control structure.

Before Situation:
Water needs to be controlled in a more desirable manner. The gate will be installed to control water flow for irrigation systems.

After Situation:
The gates will play an integral role in application of more efficient irrigation water delivery and on farm systems.

Feature Measure: diameter

Scenario Unit: Inch

Scenario Typical Size: 12.0

Scenario Total Cost: $865.30

Scenario Cost/Unit: $72.11

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	3	$72.57
Materials						
Screw gate, cast iron, 1' diameter, 10/0 head	1861	1' diameter cast iron screw (canal) gate rated at 10 seating head 0 feet unseating head. Materials only.	Each	$792.73	1	$792.73

Practice: 587 - Structure for Water Control

Scenario: #9 - HDPE Turnout

Scenario Description:

A HDPE pipe equipped with a slide gate diverts water from a ditch or canal into a field or field ditch. This scenario is for a 15 inch diameter gate and pipe that will transmit approximately 4 cfs of flow.

Before Situation:

A ditch or canal exists, but a means to move water from the ditch into a smaller ditch or field does not exist. A water supply of sufficient quantity and quality is available for irrigation.

After Situation:

Water is diverted from a canal or ditch to meet irrigation requirements. A 15 inch diameter HDPE pipe is installed through the canal containment dike. A 15 inch diameter slide gate is attached to the upstream end of the pipe. The top of the pipe inlet is below canal water surface elevation.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 10.0

Scenario Total Cost: $4,378.91

Scenario Cost/Unit: $437.89

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$29.47	20	$589.40
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	40	$967.60
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	20	$529.20
Materials						
Pipe, HDPE, 12 in., PCPT, Single Wall	1274	Pipe, Corrugated Plastic Tubing, Single Wall, Perforated, 12 inch diameter - ASTM F667. Material cost only.	Feet	$5.07	100	$507.00
Slide gate, steel, 1' diameter, low head	1830	1' diameter steel slide gate for low head installations	Each	$155.00	10	$1,550.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 587 - Structure for Water Control

Scenario: #10 - CMP Turnout

Scenario Description:

A corrugated metal pipe (CMP) equipped with a slide gate diverts water from a ditch or canal into a field or field ditch. This scenario is for a 15 inch diameter gate and pipe that will transmit approximately 4 cfs of flow.

Before Situation:

A ditch or canal exists, but a means to move water from the ditch into a smaller ditch or field does not exist. A water supply of sufficient quantity and quality is available for irrigation.

After Situation:

Water is diverted from a canal or ditch to meet irrigation requirements. A 15 inch diameter CMP is installed through the canal containment dike,. A 15 inch diameter slide gate is attached to the upstream end of the pipe. The top of the pipe inlet is below canal water surface elevation.

Feature Measure: Each

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $728.93

Scenario Cost/Unit: $728.93

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$29.47	2	$58.94
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	4	$96.76
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	2	$52.92
Materials						
Pipe, CMP, 12 in., 16 Gauge	1269	12 inch Corrugated Metal Pipe, Galvanized, Uncoated, 16 gage. Material cost only.	Feet	$12.96	10	$129.60
Slide gate, steel, 1' diameter, low head	1830	1' diameter steel slide gate for low head installations	Each	$155.00	1	$155.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 587 - Structure for Water Control

Scenario: #11 - Concrete Turnout Structure

Scenario Description:
A reinforced concrete structure designed to measure, divide, deliver and/or control water level efficiently.

Before Situation:
Current water control structure is either non-existent, inefficient or not controlling water in an efficient or desired manner. A water supply of sufficient quantity and quality is available for the desired use.

After Situation:
Water is controlled efficiently for desired use. All footings, floors. and walls have a minimum thickness of six inches.

Feature Measure: CY Reinforced Concrete

Scenario Unit: Cubic Yards

Scenario Typical Size: 5.0

Scenario Total Cost: $6,189.43

Scenario Cost/Unit: $1,237.89

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$494.40	5	$2,472.00
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$29.47	8	$235.76
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	40	$1,364.80
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	64	$1,548.16
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	8	$211.68
Materials						
Steel, Plate, 3/16 in.	1048	Flat Steel Plate, 3/16 inch thick, materials only.	Square Feet	$6.02	12	$72.24
Wire Mesh Screen, galvanized, 1/16 in	1229	Wire Mesh Screen, galvanized, 1/16 inch grid spacing. Materials only.	Square Feet	$4.09	12	$49.08
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 587 - Structure for Water Control

Scenario: #12 - Concrete Turnout Structure - Small

Scenario Description:

A reinforced concrete turnout structure equipped with slide boards or panels diverts irrigation water from a ditch or canal into a field, field ditch, or irrigation pipeline. This scenario is for a five ft tall, four foot wide, and 10 foot long turnout structure.

Before Situation:

A ditch or canal exists, but a means to move water from the ditch into a smaller ditch or field does not exist. A water supply of sufficient quantity and quality is available for irrigation.

After Situation:

Water is diverted from a canal or ditch to meet irrigation requirements. A 4 foot wide and 5 foot tall turnout structure equipped with slots for slide boards and panels, and a trash screen/rack conducts water through the canal berm into a field. The concrete structure is 10 feet long and has a water measuring device. All footings, floors. and walls have a minimum thickness of six inches. The structure delivers water to field elevation or ditch bottom elevation. The top of the pipe inlet is below canal water surface elevation.

Feature Measure: CY Reinforced Concrete

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $3,155.30

Scenario Cost/Unit: $3,155.30

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$494.40	2.9	$1,433.76
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$29.47	3	$88.41
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	32	$774.08
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	4	$105.84
Materials						
Slide gate, steel, 2' diameter, low head	1829	2' diameter steel slide gate for low head installations	Each	$517.50	1	$517.50
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 587 - Structure for Water Control

Scenario: #13 - Concrete Turnout Structure - high flow

Scenario Description:

A reinforced concrete turnout structure equipped with slide boards or panels diverts irrigation water from a ditch or canal into a field, field ditch, or irrigation pipeline. This scenario is for a five ft tall, 15 feet wide, and 10 foot long turnout structure. High flow is equal or greater than 14 cfs.

Before Situation:

A ditch or canal exists, but a means to move water from the ditch into a smaller ditch or field does not exist. A water supply of sufficient quantity and quality is available for irrigation.

After Situation:

Water is diverted from a canal or ditch to meet irrigation requirements. A 15 foot wide and 5 foot tall turnout structure equipped with jack gates, and a concrete block energy dissapator as part of the apron. The concrete structure is 10 feet long and has a water measuring device. All footings, floors. and walls have a minimum thickness of six inches. The structure delivers water to field elevation or ditch bottom elevation. The top of the pipe inlet is below canal water surface elevation.

Feature Measure: CY reinforced concrete

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $6,213.50

Scenario Cost/Unit: $6,213.50

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$494.40	6.8	$3,361.92
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$29.47	5	$147.35
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	48	$1,161.12
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	8	$211.68
Materials						
Block, concrete	253	Concrete block, hollow, normal weight, 3500 psi. Includes both full and partial sizes. Material only	Each	$2.53	24	$60.72
Slide gate, steel, 2' diameter, low head	1829	2' diameter steel slide gate for low head installations	Each	$517.50	2	$1,035.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 587 - Structure for Water Control

Scenario: #14 - Flow Meter with Mechanical Index

Scenario Description:

Permanently installed water flow meter with mechanical, cumulative volume and rate index. Meters can be any flow measurement device that meets CPS 433, (i.e. meters: turbine, propeller, acoustic, magnetic, venturi, orifice, etc.) with or without straightening vanes. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, and Degraded Plant Condition - Undesirable plant productivity and health, and Inefficient Energy Use - Equipment and facilities Associated Practices: 533-Pumping Plant, 449-Irrigation Water Management, 441-Irrigation System, Microirrigation, 443-Irrigation System Surface and Subsurface, 442-Irrigation System, Sprinkler, 328-Conservation Crop Rotation, 634-Waste Transfer, and 590-Nutrient Management.

Before Situation:

Producer estimates seasonal and individual irrigation application flow rate and volumes based on energy costs, system operating pressure, or other means.

After Situation:

Producer is able to access instantaneous rate and cumulative flow volume data at the meter location. The information gained will enable the irrigator to improve irrigation water management, recognize system performance issues before they become critical, and reduce energy use.

Feature Measure: Nominal Diameter of Meter

Scenario Unit: Inch

Scenario Typical Size: 10.0

Scenario Total Cost: $1,652.09

Scenario Cost/Unit: $165.21

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Materials						
Flow Meter, with mechanical Index	1450	10 inch, Turbine Type Flow Meter with Mechanical Index, permanently installed. Includes material, labor and installation.	Each	$1,521.91	1	$1,521.91
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	2	$130.18

Practice: 587 - Structure for Water Control

Scenario: #15 - Flow Meter with Electronic Index

Scenario Description:

Permanently installed water flow meter with an electronic index . Meters can be any flow measurement device that meets CPS 433, (i.e., meters: turbine, propeller, acoustic, magnetic, venturi, orifice, etc.) with or without straightening vanes or data logging capability. Meter nominal diameter for insert type turbine meters will be installation pipe size. Typical installation would include installation of a 10 inch turbine flow meter, with electronic index output. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, and Degraded Plant Condition - Undesirable plant productivity and health, and Inefficient Energy Use - Equipment and facilities Associated Practices: 533-Pumping Plant, 449-Irrigation Water Management, 441-Irrigation System, Microirrigation, 443-Irrigation System Surface and Subsurface, 442-Irrigation System, Sprinkler, 328-Conservation Crop Rotation, 634-Waster Transfer, and 590-Nutrient Management.

Before Situation:

Producer estimates seasonal and individual irrigation application flow rate and volumes based on energy costs, system operating pressure, or other means.

After Situation:

Producer is able to access instantaneous rate and cumulative flow volume data at the meter location. The information gained will enable the irrigator to improve irrigation water management, recognize system performance issues before they become critical, and reduce energy use.

Feature Measure: Nominal Diameter of Meter

Scenario Unit: Inch

Scenario Typical Size: 10.0

Scenario Total Cost: $2,943.87

Scenario Cost/Unit: $294.39

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Materials						
Flow Meter, with Electronic Index	1452	10 inch Turbine Irrigation flow meter, with Electronic Index, Rate and Volume, permanently installed. Materials only.	Each	$2,813.69	1	$2,813.69
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	2	$130.18

Practice: 587 - Structure for Water Control

Scenario: #16 - Steel Fabrication

Scenario Description:
Fabricating steel into water controls structures, weir plates, trash racks, measuring flumes etc.

Before Situation:
Current water control structures are either non-existant, ineffecient or not controling water in an effecient or desired manner. A water supply of sufficient quantity and quality is available for the desired use.

After Situation:
Water is measured and controled effeciently for desired use.

Feature Measure: Weight

Scenario Unit: Pound

Scenario Typical Size: 320.0

Scenario Total Cost: $1,006.38

Scenario Cost/Unit: $3.14

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$29.47	4	$117.88
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	8	$272.96
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	4	$105.84
Materials						
Steel, Plate, 3/16 in.	1048	Flat Steel Plate, 3/16 inch thick, materials only.	Square Feet	$6.02	32	$192.64
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	2	$317.06

Practice: 587 - Structure for Water Control

Scenario: #17 - Cleaning Screens

Scenario Description:
Clean trash. debris and sediment from water to be used for irrigation.

Before Situation:
Dirty water inhibits desired use of water in various irrigation systems.

After Situation:
Water is cleaned and inables design and application of high effeciency irrigation systems.

Feature Measure: Weight

Scenario Unit: Pound

Scenario Typical Size: 120.0

Scenario Total Cost: $1,412.92

Scenario Cost/Unit: $11.77

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	40	$1,364.80
Materials						
Steel, Plate, 1/8 in.	1047	Flat Steel Plate, 1/8 inch thick, materials only.	Square Feet	$4.01	12	$48.12

Practice: 587 - Structure for Water Control

Scenario: #18 - Sheet Piling Structure

Scenario Description:
Construction of a sheet piling structure to divert or control water in streams and other water courses.

Before Situation:
Unable to divert water from a water course into irrigation system.

After Situation:
Able to consistently divert desired amount of water into irrigation system.

Feature Measure: Square Foot

Scenario Unit: Square Feet

Scenario Typical Size: 700.0

Scenario Total Cost: $42,768.38

Scenario Cost/Unit: $61.10

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Portable Welder	1407	Portable field welder. Equipment only. Labor not included.	Hours	$18.64	6	$111.84
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	6	$204.72
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic Yards	$84.32	70	$5,902.40
Sheet piling, steel, 25'	1406	Steel sheet pile, panels or barrier driven 15 to 25 feet and left in place. Includes materials, equipment and labor.	Square Feet	$51.54	700	$36,078.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 587 - Structure for Water Control

Scenario: #19 - Surge Valve

Scenario Description:
The use of surge valves with controllers to effeciently apply water to cropland.

Before Situation:
In-efficient or less efficient irrigation system in place before surge system applied./

After Situation:
Irrigation effeciency and uniformity is improved.

Feature Measure: surge valve

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $2,522.34

Scenario Cost/Unit: $2,522.34

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Materials						
Surge Valve And Controller	1477	Surge Valve and Controller, with appurtenances. Material cost includes valve, controller, all appurtenances, and mobilization.	Each	$2,522.34	1	$2,522.34

Practice: 587 - Structure for Water Control

Scenario: #20 - Flow Meter with Electronic Index & Telemetry

Scenario Description:

Permanently installed water flow meter with an electronic flow rate and volume index and data telemetry transmission system. Meters can be any flow measurement device that meets CPS 433, (i.e. meters: turbine, propeller, acoustic, magnetic, venturi, orifice, etc.) with or without straightening vanes. Meter nominal diameter for insert type turbine meters will be installation pipe size. Typical installation would include installation of a 10 inch magnetic flow meter, with electronic index output and telemetry data transfer system for monitoring irrigation system flow rate. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, and Degraded Plant Condition - Undesirable plant productivity and health, and Inefficient Energy Use - Equipment and facilities Associated Practices: 533-Pumping Plant, 449-Irrigation Water Management, 441-Irrigation System, Microirrigation, 443-Irrigation System Surface and Subsurface, 442-Irrigation System, Sprinkler, 328-Conservation Crop Rotation, 634-Waste Transfer, and 590-Nutrient Management.

Before Situation:

Producer estimates seasonal and individual irrigation application flow rate and volumes based on energy costs, system operating pressure, or other means.

After Situation:

Producer is able to access instantaneous rate and cumulative flow volume data from a personal computer or cell phone at any time. The information gained will enable the irrigator to improve irrigation water management, recognize system performance issues before they become critical, and reduce energy use.

Feature Measure: Nominal Diameter of Meter

Scenario Unit: Inch

Scenario Typical Size: 10.0

Scenario Total Cost: $4,222.14

Scenario Cost/Unit: $422.21

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Materials						
Flow Meter, with electronic Index and telemetry	1451	10 inch Magnetic Irrigation Flow Meter, with electronic index and equipped for telemetry, permanently installed. Includes material, meter appurtenances, and installation.	Each	$4,091.96	1	$4,091.96
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	2	$130.18

Practice: 587 - Structure for Water Control

Scenario: #21 - Wood irrigation Structures

Scenario Description:
Constructing treated or red wood water controls structures.

Before Situation:
Current water control structures are either non-existant, ineffecient or not controling water in an effecient or desired manner. A water supply of sufficient quantity and quality is available for the desired use.

After Situation:
Water is measured and controled effeciently for desired use.

Feature Measure: Square Foot

Scenario Unit: Square Feet

Scenario Typical Size: 1,000.0

Scenario Total Cost: $5,096.68

Scenario Cost/Unit: $5.10

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$29.47	4	$117.88
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	16	$545.92
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	16	$387.04
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	4	$105.84
Materials						
Lumber, planks, posts and timbers, treated	1609	Treated dimension lumber with nominal thickness greater than 2". Includes lumber and fasteners. Does not include labor.	Board Feet	$1.97	2000	$3,940.00

Practice: 587 - Structure for Water Control

Scenario: #22 - Large, in-stream, Concrete Irrigation Water Diversion Structure

Scenario Description:

Typical setting is in a stream or irrigation canal. Typical installation consists of installing a rectangular shaped concrete structure for the purpose of raising the water surface profile. Cost estimate is for one structure with a effective width of 75', and total length of 20', effective height of 3', max height of 6', and 12" thick walls and floor; containing 245 cubic yards of Concrete. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as water quantity, water qu,ality degradation, soil erosion-concentrated flow erosion, and fish and recreation passage.

Before Situation:

The stream presently is annually manipulated with heavy equipment to maintain a water surface elevation allowing diversion of irrigation water. This condition has caused the degredation of the stream bed, excessive erosion and sediment deposition down stream, disruption of fish migration, with only floods well above normal high-water escaping the high banks of the stream. Excessive maintenance costs to maintain water levels occur annually.

After Situation:

Banks are stabilized, and the water surface elevation is easily maintained. Water quality is protected downstream due to erosion protection, fish migration is accomplished, and annual maintenancey costs are reduced. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Streambank and Shoreline Protection (580) Channel Bed Stabilization (584), Stream Habitat Improvement and Management (395), and Wetland Wildlife Habitat Management (644) will use the corresponding Standard(s) as appropriate.

Feature Measure: Volume of Reinforced Concrete

Scenario Unit: Cubic Yards

Scenario Typical Size: 245.0

Scenario Total Cost: $402,604.89

Scenario Cost/Unit: $1,643.29

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$494.40	245	$121,128.00
Clearing and Grubbing	40	Clearing and Grubbing, includes materials, equipment and labor	Acres	$325.13	2	$650.26
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$5.40	120	$648.00
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hours	$120.60	40	$4,824.00
Water management, Flooding & dewatering	969	Includes equipment and power unit. Labor not included.	Acre Feet	$169.04	320	$54,092.80
Excavation, common earth, large equipment, 150 ft	1223	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yards	$3.64	500	$1,820.00
Compaction, earthfill, vibratory plate	1260	Compaction of earthfill with a walk behind vibratory plate compactor in typical 6-8 inch thick lifts, 2 passes. Includes equipment and labor.	Cubic Yards	$1.99	107	$212.93
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	520	$17,742.40
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	3600	$87,084.00
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	720	$32,644.80
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic Yards	$84.32	243	$20,489.76
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	40	$1,202.80
Steel, Plate, 3/16 in.	1048	Flat Steel Plate, 3/16 inch thick, materials only.	Square Feet	$6.02	960	$5,779.20
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic Yards	$22.79	38	$866.02

Structural steel tubing, 2 in. diameter	1120	Structural steel tubing, 2 inch diameter, 1/8 inch wall thickness, materials only	Feet	$4.09	150	$613.50
Screw gate, cast iron, 4' diameter, 10/0 head	1746	4' diameter cast iron screw (canal) gate rated at 10 seating head 0 feet unseating head. Includes materials only.	Each	$6,455.75	8	$51,646.00
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	4	$260.36
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	2	$900.06

Practice: 587 - Structure for Water Control

Scenario: #23 - Pressure Regulating Station

Scenario Description:

The installation of an inline pressure reuglator in order to regulate the internal water pressure in an irrigation pipeline including thrust blocks, air vents, isolation valves. Conversion from typical buried to steel pipe to above ground installation is necessary for operation and maintenance. Reinforced concrete pad is required to anchor all installed items.

Before Situation:

Pressure in irrigation pipeine is not regulated and can vary with the flow rate. Excessively high pressures can develop that decrease effective irrigation water management and operation of the pipeline system. Flow distribution is uneven.

After Situation:

Constant pressure at a predefined, safe level can be maintained. Water management, distribution can be maintained at a constant level.

Feature Measure: Number of installed stations

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $4,852.84

Scenario Cost/Unit: $4,852.84

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$372.36	0.8	$297.89
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$29.47	2	$58.94
Compaction, earthfill, vibratory plate	1260	Compaction of earthfill with a walk behind vibratory plate compactor in typical 6-8 inch thick lifts, 2 passes. Includes equipment and labor.	Cubic Yards	$1.99	32	$63.68
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	4	$136.48
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	8	$193.52
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	4	$444.84
Materials						
Structural steel tubing, 2 in. diameter	1120	Structural steel tubing, 2 inch diameter, 1/8 inch wall thickness, materials only	Feet	$4.09	160	$654.40
Pipe, Steel, 10 in., Std Wt	1364	Materials: - 10 inch - Steel Std Wt	Feet	$83.91	32	$2,685.12
Steel, Angle, 2 1/2 in. x 2 1/2 in. x 1/4 in.	1372	Materials: Angle, 2 1/2 inch x 2 1/2 inch x 1/4 inch. Meets ASTM A36	Feet	$3.95	16	$63.20
Steel, Plate, 3/8 in.	1375	Flat steel plate, 3/8 inch thickness. Materials only.	Square Feet	$12.03	8	$96.24
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53

Practice: 587 - Structure for Water Control

Scenario: #24 - Culvert >= 30 inches HDPE

Scenario Description:

Install a new HDPE culvert greater than or equal to 30 inches in diameter to convey water under roads or other barriers. A typical scenario would be an 36 inch diameter pipe, 40 feet in length. Work includes site preparation, acquiring and installing culvert pipe with gravel bedding and fill (compacted), and riprap protection of side slopes. Use (396) Aquatic Organism Passage when the primary intent is biological concerns, not hydrologic.

Before Situation:

Water flow needs to be conveyed under an access road, ditch or other barrier. Water must be conveyed in a controlled fashion.

After Situation:

Water is conveyed in a controlled manner. Associated practices could be Access Road (560), Animal Trails and Walkways (575), Critical Area Planting (342), Drainage Water Management (554), Irrigation Canal or Lateral (320), Irrigation Pipeline (430), Irrigation Reservoir (436), Irrigation System, Surface and Subsurface (443), Irrigation System, Tailwater Recovery (447), Irrigation Water Management (449), Lined Waterway or Outlet (468), Obstruction Removal (500), Pond (378), Stormwater Runoff Control (570), Surface Drain, Field Ditch (607), Surface Drain, Main or Lateral (608), and Trails and Walkways (568).

Feature Measure: Pipe Diameter (In) x Pipe Length (Ft

Scenario Unit: Diameter Inch Foot

Scenario Typical Size: 1,440.0

Scenario Total Cost: $3,435.31

Scenario Cost/Unit: $2.39

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	5	$10.40
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$5.40	45	$243.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	10	$241.90
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic Yards	$84.32	2	$168.64
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	5	$150.35
Pipe, HDPE, CPT, Double Wall, Soil Tight, 36 in.	1248	Pipe, Corrugated HDPE Double Wall, 36 inch diameter with soil tight joints - AASHTO M294. Material cost only.	Feet	$53.74	40	$2,149.60
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 587 - Structure for Water Control

Scenario: #25 - Culvert >= 30 inches CMP

Scenario Description:

Install a new CMP culvert greater than or equal to 30 inches in diameter to convey water under roads or other barriers. A typical scenario would be an 36 inch diameter pipe, 40 feet in length. Work includes site preparation, acquiring and installing culvert pipe with gravel bedding and fill (compacted), and riprap protection of side slopes. Use (396) Aquatic Organism Passage when the primary intent is biological concerns, not hydrologic.

Before Situation:

Water flow needs to be conveyed under an access road, ditch or other barrier. Water must be conveyed in a controlled fashion.

After Situation:

Water is conveyed in a controlled manner. Associated practices could be Access Road (560), Animal Trails and Walkways (575), Critical Area Planting (342), Drainage Water Management (554), Irrigation Canal or Lateral (320), Irrigation Pipeline (430), Irrigation Reservoir (436), Irrigation System, Surface and Subsurface (443), Irrigation System, Tailwater Recovery (447), Irrigation Water Management (449), Lined Waterway or Outlet (468), Obstruction Removal (500), Pond (378), Stormwater Runoff Control (570), Surface Drain, Field Ditch (607), Surface Drain, Main or Lateral (608), and Trails and Walkways (568).

Feature Measure: Pipe Diameter (In) x Pipe Length (Ft

Scenario Unit: Diameter Inch Foot

Scenario Typical Size: 1,440.0

Scenario Total Cost: $3,608.11

Scenario Cost/Unit: $2.51

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	5	$10.40
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$5.40	45	$243.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	10	$241.90
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic Yards	$84.32	2	$168.64
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	5	$150.35
Pipe, CMP, 36 in., 12 Gauge	1825	36 inch Corrugated Metal Pipe, Galvanized, Uncoated, 16 gage. Material cost only.	Feet	$58.06	40	$2,322.40
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 587 - Structure for Water Control

Scenario: #27 - Inline Valve less than 12 inch

Scenario Description:
The use of inline valves less than 12" diameter to regulate and control water in a high pressure irrigation pipeline to a field. The use of inline valves to distribute water within an irrigation pipeline system more efficiently to meet crop requirement needs.

Before Situation:
Irrigation efficiency and delivery from earthen ditch to field are low.

After Situation:
Irrigation effeciency and distribution are improved.

Feature Measure: diameter

Scenario Unit: Inch

Scenario Typical Size: 10.0

Scenario Total Cost: $389.17

Scenario Cost/Unit: $38.92

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	1	$24.19
Materials						
Valve, Inline, < 12 inch dia.	2367	Inline valve less than 12 inch diameter to control direction and volume of flow within a pipeline system. Materials only.	Each	$364.98	1	$364.98

Practice: 587 - Structure for Water Control

Scenario: #28 - Inline valve >=12 inch

Scenario Description:
Inline Valve greater than or equal to 12"

Before Situation:
The use of inline valves greater than or equal to 12" diameter to regulate and control water in a high pressure irrigation pipeline to a field. The use of inline valves to distribute water within an irrigation pipeline system more efficiently to meet crop requirement needs.

After Situation:
Irrigation efficiency and delivery from earthen ditch to field are low.

Feature Measure: Irrigation effeciency and distributio

Scenario Unit: Inch

Scenario Typical Size: 14.0

Scenario Total Cost: $2,813.69

Scenario Cost/Unit: $200.98

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	1	$24.19
Materials						
Valve, Inline, => 12 inch dia.	2368	Inline valve greater than or equal to 12 inch diameter to control direction and volume of flow within a pipeline system. Materials only.	Each	$2,789.50	1	$2,789.50

Practice: 587 - Structure for Water Control

Scenario: #29 - chemigation valve <12 inch

Scenario Description:
The use of chemigation valves less than 12" diameter to regulate and control injection of chemicals into irrigation systems.

Before Situation:
Nutrient application low efficiency.

After Situation:
Nutrient application is improved.

Feature Measure: diameter

Scenario Unit: Inch

Scenario Typical Size: 10.0

Scenario Total Cost: $523.29

Scenario Cost/Unit: $52.33

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	1	$24.19
Materials						
Valve, Chemigation, < 12 inch dia.	2369	Chemigation valve less than 12 inch diameter for controlling injection of chemicals into irrigation systems. Materials only.	Each	$499.10	1	$499.10

Practice: 587 - Structure for Water Control

Scenario: #30 - Chemigation valve >=12 inch

Scenario Description:
0

Before Situation:
Irrigation efficiency and delivery from earthen ditch to field are low.

After Situation:
Irrigation effeciency and distribution are improved.

Feature Measure: diameter

Scenario Unit: Inch

Scenario Typical Size: 12.0

Scenario Total Cost: $1,387.62

Scenario Cost/Unit: $115.64

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	1	$24.19
Materials						
Valve, Chemigation, => 12 inch dia.	2370	Chemigation valve greater than or equal to 12 inch diameter for controlling injection of chemicals into irrigation systems. Materials only.	Each	$1,363.43	1	$1,363.43

Practice: 590 - Nutrient Management

Scenario: #1 - Basic NM (Non-Organic/Organic)

Scenario Description:

This scenario describes the implementation of a basic nutrient management system on > = 40 acres of cropland or hayland where there is no manure application. Scenario is applicable on non-organic and organic land. The planned NM system will meet the current Nutrient Management (590) CPS. Implementation will result in the proper rate, source, method of placement, and timing of nutrient application. Payment for implementation is to defray the costs of soil testing, analysis, and implementation of the nutrient management plan and recordkeeping. Records demonstrating implementation of the 4 R's of NM will be required.

Before Situation:

In this geographic area, a fertility program is either nonexistent or does not meet the Nutrient Management (590) CPS. Soil testing is not completed on a regular basis and applications of fertilizers are not based on land grant university recommendations or a nutrient budget. An environmental evaluation or risk assessment is not completed. Nutrients are transported to surface waters through runoff, drainage tile, or soil erosion, or to ground water from leaching in quantities that degrade water quality and limit use of intended purposes. Soil quality may be degraded by excess or inadequate nutrients. Fields have little or no erosion protection during critical periods often times resulting in sheet, rill, and ephemeral erosion.

After Situation:

A nutrient management system will be developed to meet the current Nutrient Management (590) CPS, when applicable system will also meet NOP regulations. Development and implementation of a nutrient management plan (NMP) will benefit plant productivity while also reducing potential for off-site degradation. A nutrient management budget will be developed for each field(s) based on soil test analysis and land grant university recommendations or crop removal rates. On planning units typically 40 acres or larger, soil testing is completed according to LGU recommendations. Records will be provided annually of the current soil test, analysis, application rates, forms and rates of nutrients for each field, including crop yields. Nutrient applications will be completed according to the Nutrient Management Plan that minimizes nutrient runoff and leaching or buildup of excess nutrient concentrations.

Feature Measure: <Unknown>

Scenario Unit: Acres

Scenario Typical Size: 40.0

Scenario Total Cost: $364.99

Scenario Cost/Unit: $9.12

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	1	$22.29
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	4	$96.76
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	2	$222.42
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$11.76	2	$23.52

Practice: 590 - Nutrient Management

Scenario: #2 - Basic NM with Manure Injection or Incorporation

Scenario Description:

This scenario describes the implementation of a basic nutrient management system on > = 40 acres of cropland or hayland where all applied nutrient sources (nitrogen, phosphorus, and potassium) are either incorporated using tillage at least 3-4 inches deep or injected into the soil at least 3-6 inches deep (Exceptions for incorporation or injection include: established close grown crops such as wheat or perennial crops such as hay or pasture). This scenario is applicable on non-organic and organic land for all nutrient sources (manure, compost, commercial fertilizers, and organic sources of nutrients). Micro-nutrients may be surface applied. The planned NM system will meet the current Nutrient Management (590) CPS. Implementation will result in the proper rate, source, method of placement (incorporation or injection), and timing of nutrient application. Payment for implementation is to defray the costs of soil testing, manure analysis, incorporation or injection of all nutrients, and the implementation of the nutrient management plan and recordkeeping. Records demonstrating implementation of the 4 R's of NM will be required. Scenario is designed to address the Nutrient Management (590) purposes for nitrogen losses via N2O emissions, nitrogen leaching, and nitrogen and phosphorus surface runoff. The basis for nutrient applications will be recommendations based on soil tests; and when applicable, plant tissue, manure, and compost analyses. Soil loss is controlled to the soil loss tolerance criteria or less for the significant soil map unit.

Before Situation:

In this geographic area, a fertility program is not properly managed to supply the proper rate, timing, method of application, and source to address air and water quality. Application of fertilizers, including manures, composts, and amendments, are surface applied and completed annually based upon tradition that does not specifically consider the detrimental effects of improper timing or rates of all nutrient sources, or excess nutrient buildup in the soil, emissions of N2O, surface runoff, or the leaching of nitrogen to ground or surface water via subsurface drainage. Fields are overwintered with little or no erosion protection often times resulting in sheet, rill, and ephemeral erosion by spring. Soil testing is not completed on a regular basis and applications of all nutrient sources are not based on land grant university recommendations or a nutrient budget. An environmental evaluation or risk assessment is not completed. Nutrients are transported to surface waters through runoff, drainage tile, soil erosion, or to ground water from leaching in quantities that degrade air and water quality. Soil quality may be degraded by excess or inadequate nutrients and erosion. Fields have little or no erosion protection during critical periods often times resulting in sheet, rill, and ephemeral erosion in excess of the planning criteria.

After Situation:

A nutrient management system is developed with the producer to meet the current Nutrient Management (590) CPS; and when applicable, the system will also meet NOP regulations. All nutrient sources will be incorporated with tillage at least 3-4 inches deep or injected at least 4-6 inches deep into the soil (Exceptions for incorporation or injection include: established close grown crops such as wheat or perennial crops such as hay or pasture). Implementation of the nutrient management plan (NMP) will benefit plant productivity while also reducing the potential for off-site degradation. A nutrient management budget will be developed for each field based on soil test analysis and land grant university recommendations or crop removal rates. On planning units typically 40 acres or larger, soil testing (and where applicable manure analyses, plant tissue analyses, etc.) is completed according to LGU recommendations. Applications of all phosphorus and nitrogen sources are based on risk assessments (PI - phosphorus index and leaching index). Records will be provided annually documenting current soil tests and other plant or manure analyses, date and rate of applications, form and placement of nutrients for each field, including post-harvest yields. Nutrient applications will be completed according to the NMP that minimizes nutrient runoff, nitrogen leaching, nitrogen emissions, or buildup of excess nutrient concentrations in the soil.

Feature Measure: <Unknown>

Scenario Unit: Acres

Scenario Typical Size: 40.0

Scenario Total Cost: $1,373.69

Scenario Cost/Unit: $34.34

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	1	$22.29
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acres	$15.10	40	$604.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	8	$193.52
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	4	$444.84
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$11.76	2	$23.52
Test, Manure Analysis	306	Moisture, Total N, P, K. Includes materials and shipping only.	Each	$40.16	1	$40.16
Test, Compost Analysis	307	Moisture, Total N, P, K. Includes materials and shipping only.	Each	$45.36	1	$45.36

Practice: 590 - Nutrient Management

Scenario: #3 - Small Farm NM (Non-Organic/Organic)

Scenario Description:

Scenario is applicable on non-organic and organic land. Scenario implementation of a basic nutrient management system on small, often diversified farm systems typically between 0.5-10 acres where manure and/or compost may be utilized either alone or in conjunction with commercial fertilizer. The planned NM system will meet the current Nutrient Management (590) CPS. Implementation will result in the proper rate, source, method of placement, and timing of nutrient application. Payment for implementation is to defray the costs of soil testing, manure and/or compost analysis, and implementation of the nutrient management plan and recordkeeping. Records demonstrating implementation of the 4 R's of NM will be required. Scenario is designed to encourage producers to effectively utilize commercial fertilizers, organic fertilizers, manure, and/or compost appropriately improving soil quality and minimizing runoff of nutrients from fields to surface waters. The basis for nutrient applications will be recommendations based on soil, manure, and compost analyses.

Before Situation:

In this geographic area, a fertility program is either nonexistent or does not meet the Nutrient Management (590). Soil testing is not completed on a regular basis and applications of fertilizers are not based on land grant university recommendations or a nutrient budget. An environmental evaluation or risk assessment is not completed. Nutrients are transported to surface waters through runoff, drainage tile, or soil erosion, or to ground water from leaching in quantities that degrade water quality and limit use of intended purposes. Soil quality may be degraded by excess or inadequate nutrients. Fields have little or no erosion protection during critical periods often times resulting in sheet, rill, and ephemeral erosion.

After Situation:

A nutrient management system will be developed to meet the current Nutrient Management (590), when applicable system will also meet NOP regulations. Development and implementation of a nutrient management plan (NMP) will benefit plant productivity while also reducing potential for off-site degradation. A nutrient management budget will be developed for each field, crop block, or crop rotation within a block/field based on soil test analysis and land grant university recommendations or crop removal rates. Application of nutrients will be completed at the proper rate, timing, and methods, and sources per the NMP. Records will be provided annually of current soil test, analysis, application timing, nutrient source, application method, application rate, and crop yields for each block. Nutrient applications will be completed according to the NMP that minimizes nutrient runoff and leaching or buildup of excess nutrient concentrations.

Feature Measure: <Unknown>

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $292.82

Scenario Cost/Unit: $292.82

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	3	$72.57
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	1	$111.21
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$11.76	2	$23.52
Test, Manure Analysis	306	Moisture, Total N, P, K. Includes materials and shipping only.	Each	$40.16	1	$40.16
Test, Compost Analysis	307	Moisture, Total N, P, K. Includes materials and shipping only.	Each	$45.36	1	$45.36

Practice: 590 - Nutrient Management

Scenario: #4 - Basic NM with Manure and/or Compost (Non-Organic/Organic)

Scenario Description:

This scenario describes the implementation of a basic nutrient management system on > = 40 acres of cropland or hayland where manure and/or compost is utilized either alone or in conjunction with commercial fertilizer. Scenario is applicable on non-organic and organic land. The planned NM system will meet the current Nutrient Management (590) CPS. Implementation will result in the proper rate, source, method of placement, and timing of nutrient application. Payment for implementation is to defray the costs of soil testing, manure and/or compost analysis, and implementation of the nutrient management plan and recordkeeping. Records demonstrating implementation of the 4 R's of NM will be required. Scenario is designed to encourage producers to effectively utilize commercial fertilizers, organic fertilizers, manure, and/or compost appropriately improving soil quality and minimizing runoff of nutrients from fields to surface waters. The basis for nutrient applications will be recommendations based on soil, manure, and compost analyses.

Before Situation:

In this geographic area, a fertility program is either nonexistent or at a basic level. Application of fertilizers, including manures, composts, and amendments, are completed annually based upon tradition that does not specifically consider the detrimental effects of improper timing or rates of nutrients, or excess nutrient buildup in the soil. Fields are overwintered with little or no erosion protection often times resulting in sheet, rill, and ephemeral erosion by spring. Soil testing is not completed on a regular basis and applications of fertilizers are not based on land grant university recommendations or a nutrient budget. An environmental evaluation or risk assessment is not completed. Nutrients are transported to surface waters through runoff, drainage tile, or soil erosion, or to ground water from leaching in quantities that degrade water quality and limit use of intended purposes. Soil quality may be degraded by excess or inadequate nutrients. Fields have little or no erosion protection during critical periods often times resulting in sheet, rill, and ephemeral erosion.

After Situation:

A nutrient management system will be developed to meet the current Nutrient Management (590) CPS, when applicable system will also meet NOP regulations. Development and implementation of a nutrient management plan (NMP) will benefit plant productivity while also reducing potential for off-site degradation. A nutrient management budget will be developed for each field(s) based on soil test analysis and land grant university recommendations or crop removal rates. On planning units typically 40 acres or larger, soil testing is completed according to LGU recommendations. Records will be provided annually of the current soil test, analysis, application rate, forms and rates of nutrients for each field, including crop yields. Nutrient applications will be completed according to the Nutrient Management Plan that minimizes nutrient runoff and leaching or buildup of excess nutrient concentrations.

Feature Measure: <Unknown>

Scenario Unit: Acres

Scenario Typical Size: 40.0

Scenario Total Cost: $769.69

Scenario Cost/Unit: $19.24

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	1	$22.29
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	8	$193.52
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	4	$444.84
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$11.76	2	$23.52
Test, Manure Analysis	306	Moisture, Total N, P, K. Includes materials and shipping only.	Each	$40.16	1	$40.16
Test, Compost Analysis	307	Moisture, Total N, P, K. Includes materials and shipping only.	Each	$45.36	1	$45.36

Practice: 590 - Nutrient Management

Scenario: #5 - Basic Precision NM (Non-Organic/Organic)

Scenario Description:

This scenario takes a conventional cropping system where either no nutrient management or only a basic level of nutrient management is being practiced and improves it to address air quality (reduce emissions for N fertilizer) and/or minimize agricultural nonpoint source pollution of surface and groundwater. The planned NM system will meet the current Nutrient Management (590) CPS general and additional criteria. Precision nutrient management system includes such items as split applications, variable rate applications, nitrification or urease inhibitors, additional nutrient tests including PSNT (pre-side dress nitrogen test), CSNT (corn stalk nitrate test), and PPSN (pre-plant soil nitrate test), chlorophyll meters, and/or spectral analysis may be used to further refine nutrient applications. Payment for implementation is to defray the costs of grid or zone soil testing, additional testing and analysis, equipment, implementation of the NMP and recordkeeping. Typical treatment area is 40 acres.

Before Situation:

In this geographic area, conventional fertility programs involve very little or no soil or manure testing. Application of fertilizers, including manures and amendments, are completed annually based upon tradition that does not specifically consider the detrimental affects of improper timing or rates of nutrients, nitrous oxide emissions or excess nutrient build-up in the soil. Fields are overwintered with little or no erosion protection often times resulting in sheet, rill, and ephemeral erosion by spring. Runoff flows into adjacent streams, water courses, tile drains, field surface drains, or other water courses causing degradation to receiving waters or leaching of nutrients to shallow ground water sources. There is typically no environmental evaluation of the potential for off-site movement. Soil quality may also be detrimentally affected.

After Situation:

A precision nutrient management system will be developed to meet the current Nutrient Management (590) CPS general and additional criteria, when applicable the system will also meet NOP regulations. Development and implementation of a Nutrient Management Plan (NMP) based on the 4Rs will benefit plant productivity while reducing potential of off-site movement of nutrients, including reducing nitrogen emissions. NMP may include practices such as use of split applications, slow release nutrients, nitrification inhibitors, urease inhibitors, proper timing of application, more appropriate formulations, banding, etc. Additional nutrient tests including PSNT (pre-side dress nitrogen test), CSNT (corn stalk nitrate test), and PPSN (pre-plant soil nitrate test), chlorophyll meters, spectral analysis, etc., may also be used to further refine nutrient applications. Use of a post-harvest soil test or tissue tests will help establish the adequacy of the plan in meeting crop needs while minimizing P application rate and residual N, thus reducing the potential for off-site impacts. Potential for offsite movement of nutrient may be further reduced by identifying variability across the field(s) by using soil survey maps or other simple techniques to establish management zones, along with grid or zone soil testing. Nutrients are applied at rates based on soil test zone analyses. Nitrogen and Phosphorus risk assessment tools are completed and results included in the nutrient management system specifications as required by current NRCS 590 CPS criteria and any mitigation measures are included in the conservation plan if determined needed by risk assessment results. Soil testing is completed according to LGU recommendations. Analysis are completed at least once every three years for N-P-K, and for N annually. A nutrient budget is developed for each field or management zone annually. Records will be provided annually of the current soil test, analysis, application rates, forms and rates of nutrients for each field, including crop yields.

Feature Measure: <Unknown>

Scenario Unit: Acres

Scenario Typical Size: 40.0

Scenario Total Cost: $2,122.83

Scenario Cost/Unit: $53.07

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	2	$44.58
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$19.49	2	$38.98
Satellite imagery, aerial photography, infrared	966	Infrared imagery	Acres	$0.20	40	$8.00
Chlorophyll Reader	1125	Applicator and chlorophyll sensor includes labor. No materials	Acres	$10.82	40	$432.80
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	8	$193.52
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	6	$667.26
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$11.76	60	$705.60
Test, Plant Tissue Test	301	Tissue analysis for crops. Includes materials and shipping only.	Each	$22.74	1	$22.74
Test, Soil Nitrogen Testing	311	Pre-Side Dress/Deep Soil Testing. Includes materials and shipping only.	Each	$9.35	1	$9.35

Practice: 590 - Nutrient Management

Scenario: #8 - Adaptive NM

Scenario Description:

The practice scenario is for the implementation of nutrient management on a small plot, as detailed in outlined in Agronomy Technical Note 7 - Adaptive Nutrient Management. Scenario includes implementing replicated strip trials on a field plot to evaluate, identify and implement various nutrient use efficiency improvement methods for timing, rate, method of application, or source of nutrients.

Before Situation:

The practice will be installed on cropland (small grain rotation or typical corn-soybean rotation) to address water quality degradation, air quality degradation and energy concerns. The scenario applies to non-organic and organic operations.

After Situation:

Installation of this scenario will result in adopting the four R's of nutrient management following the procedures outlined in Agronomy Technical Note 7 - Adaptive Nutrient Management. Implementation involves establishing the replicated plots to evaluate one or more of the 4 R's. The plot will consist of at least 4 replicated plots designed, laid out, managed and evaluated with the assistance of a consultant or extension professional knowledgeable in nutrient management and experimental design and data collection. Results are used to make nutrient application decisions to address water quality degradation issues and nutrient use efficiencies. Yields will be measured and statistically analyzed and summarized following the procedures in Agronomy Technical Note 7. The yields for each plot will be adjusted to the appropriate moisture content.

Feature Measure: <Unknown>

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $2,745.88

Scenario Cost/Unit: $2,745.88

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Satellite imagery, aerial photography, infrared	966	Infrared imagery	Acres	$0.20	1	$0.20
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	25	$604.75
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	15	$1,668.15
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$11.76	2	$23.52
Test, Plant Tissue Test	301	Tissue analysis for crops. Includes materials and shipping only.	Each	$22.74	14	$318.36
Test, Soil Nitrogen Testing	311	Pre-Side Dress/Deep Soil Testing. Includes materials and shipping only.	Each	$9.35	14	$130.90

Practice: 591 - Amendments for Treatment of Agricultural Waste

Scenario: #1 - Litter Amendments for Air Quality With Partially Treated Brood Chamber

Scenario Description:

This practice scenario includes the application of a litter treatment amendment that is approved by NRCS to the entire poultry house to reduce ammonia emissions from the house and facilitate manure management. An entire poultry house is treated year round for air quality impacts. In the winter, the producer or integrator treats the brood chamber between flocks with litter amendments solely for bird health and production. The amount being applied by the producer or integrator in winter months does not meet the air quality resource concerns. Additional litter amendments are added in winter for Air Quality benefits not being applied by the integrator. Litter amendments are applied spring through fall for entire flocks. NRCS is not responsible for the litter amendments already being applied by the integrator for the purposes of production and bird health. The purpose of the practice is to address resource concerns related to air quality impacts due to particulate matter and precursors, and objectionable odors. Associated practices: Nutrient Management (590).

Before Situation:

No litter amendments are being applied during the spring through fall months. An amendment is being applied at a lower application rate during the winter months, typically half the house and only two flocks. Partial winter application is solely for production purposes and the lower application rate is not enough to address the air quality resource concerns. The operation raises 4 flocks per year and the integrator partially treats 2 flocks in the winter months. Approximately 18.7% of the needed litter amendments are being applied and only during the winter months.

After Situation:

An NRCS approved amendment is applied between each flock. All flocks are optimally treated with litter amendments year-round. A typical broiler operation with 4 flocks in a 42’ x 500’ house (21,000 square feet) is treated to reduce the impacts on air quality. Typically 100 pounds of litter amendments per 1000 square feet are applied 4 times annually. The total amendment applied is adjusted by 81.3% to account for the portion of the brood chamber that is receiving partial application during the winter months. The amendment is proven to control the odor, to reduce ammonia emissions from the litter. The selected amendment is applied in conformance with the manufacturer’s recommendations and the rates required. The resulting litter contains higher levels of nutrients and nutrient management plans must account for this. Nutrient level testing of the litter and nutrient planning shall be in conformance with CPS Nutrient Management, Code 590. The amendment successfully addresses the air quality impacts from objectionable odors, ammonia emissions, PM and PM precursors and bird health resource concerns. Formula to calculate the number of 1000 SF units: (Square Feet of house) / 1000 SF X (Number of houses) X (Number of applications/year) = Number of 1000SF/year. 21,000 SF / 1000 SF X 1 house X 4 app/yr = 84 units of 1000SF

Feature Measure: Number of 1000SF applications per

Scenario Unit: 1,000 Square Foot

Scenario Typical Size: 84.0

Scenario Total Cost: $2,014.06

Scenario Cost/Unit: $23.98

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Application of ag waste amendment for poultry litter	2020	Litter amendment application performed in house. Includes equipment, power unit and labor costs.	Ton	$52.37	3.4	$178.06
Materials						
Ag Waste Amendment, sodium bisulfate	1686	Sodium bisulfate poultry litter amendment. NRCS approved for air quality concerns to reduce ammonia emissions from the litter. Includes materials only.	Ton	$540.00	3.4	$1,836.00

Practice: 591 - Amendments for Treatment of Agricultural Waste

Scenario: #2 - Litter Amendments for Water Quality With Partially Treated Brood Chamber

Scenario Description:

This practice scenario includes the application of a litter treatment amendment that is approved by NRCS to the entire poultry house to reduce ammonia emissions and water-soluble phosphorous in the poultry litter. An entire poultry house is treated year round for air and water quality impacts. In the winter, the producer or integrator treats the brood chamber between flocks with litter amendments solely for bird health and production. The amount being applied by the producer or integrator in winter months does not meet the air and water quality resource concerns. Additional litter amendments are added in winter for Air Quality benefits not being applied by the integrator. Litter amendments are applied spring through fall for entire flocks. NRCS is not responsible for the litter amendments already being applied by the integrator for the purposes of production and bird health. The purpose of the practice is to address resource concerns related to water quality degradation due to excess nutrients and pathogens and air quality impacts due to particulate matter and associated precursors, and objectionable odors. Associated practices: Nutrient Management (590).

Before Situation:

No litter amendments are being applied during the spring through fall months. An amendment is being applied at a lower application rate during the winter months, typically half the house and only two flocks. Partial winter application is solely for production purposes and the lower application rate is not enough to address resource concerns from existing nutrient levels which may contribute to water quality degradation from nutrient runoff and leaching from fields fertilized with poultry litter and cause adverse air quality impacts such as objectionable odors and ammonia emissions.. The operation raises 4 flocks per year and the integrator partially treats 2 flocks in the winter months. Approximately 18.7% of the needed litter amendments are being applied and only during the winter months.

After Situation:

An NRCS approved amendment is applied between each flock. All flocks are optimally treated with litter amendments year-round. A typical broiler operation with 4 flocks in a 42’ x 500’ house (21,000 square feet) is treated to reduce the impacts on air and water quality. Typically 100 pounds of litter amendments per 1000 square feet are applied 4 times annually. The total amendment applied is adjusted by 81.3% to account for the portion of the brood chamber that is receiving partial application during the winter months. The amendment is proven to reduce ammonia emissions and soluble phosphorus in the litter. The selected amendment is applied in conformance with the manufacturer’s recommendations and the rates required. The resulting litter contains higher levels of nutrients and nutrient management plans must account for this. Nutrient level testing of the litter and nutrient planning shall be in conformance with CPS Nutrient Management, Code 590. The amendment successfully addresses water quality degradation from nutrients in surface and ground water and air quality impacts due to objectionable odors, ammonia emissions, PM and PM precursors and bird health resource concerns. Formula to calculate the number of 1000 SF units: (Square Feet of house) / 1000 SF X (Number of houses) X (Number of applications/year) = Number of 1000SF/year. 21,000 SF / 1000 SF X 1 house X 4 app/yr = 84 units of 1000SF

Feature Measure: Number of 1000SF applications per

Scenario Unit: 1,000 Square Foot

Scenario Typical Size: 84.0

Scenario Total Cost: $1,521.06

Scenario Cost/Unit: $18.11

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Application of ag waste amendment for poultry litter	2020	Litter amendment application performed in house. Includes equipment, power unit and labor costs.	Ton	$52.37	3.4	$178.06
Materials						
Ag Waste Amendment, aluminum sulfate, alum	1684	Aluminum sulfate, alum, poultry Litter amendment. NRCS approved for air and water quality concerns to reduce ammonia emissions and soluble phosphorus in the litter. Materials only.	Ton	$395.00	3.4	$1,343.00

Practice: 591 - Amendments for Treatment of Agricultural Waste

Scenario: #3 - Litter Amendments applied for Air Quality resource concerns

Scenario Description:

This practice scenario includes the application of a litter treatment amendment that is approved by NRCS to the entire poultry house to reduce ammonia emissions from the house and facilitate manure management. The amendment used is proven to reduce ammonia levels in the house by transforming nitrogen into a form of ammonium. The purpose of the practice is to address resource concerns from existing nutrient levels that may contribute to air quality impacts such as objectionable odors and ammonia emissions and impacts on bird health due to excess nutrients and pathogens. Associated practices: Nutrient Management (590).

Before Situation:

Integrator does not currently apply waste treatment amendments to the litter that reduce ammonia emissions.

After Situation:

This scenario is based on a typical poultry operation with a 2-house facility and each house size is 40' x 400', 16,000 SF. An NRCS approved amendment is applied between flocks, 5 flocks annually, at rate required to meet air quality resource concern, typically 100 pounds per 1000 SF. Formula to calculate the amount of amendment per year on a 1000 SF basis: (Square Feet of house) / 1000 SF X (Number of houses) X (Number of Applications per Year)= Number of 1000SF. 16,000 SF / 1000 SF X 2 houses X 5 applications/year= 160 units of 1000SF An NRCS approved amendment is applied between each flock, 5 applications, at rate required for treatment to address air quality resource concerns. For most products, this is 100 pounds per 1000 SF. The amendment is proven to control the odor, and to reduce ammonia emissions. The selected amendment is applied in conformance with the manufacturer's recommendations and the rates required. The resulting litter contains higher levels of nutrients and nutrient management plans must account for this. Nutrient level testing of the litter and nutrient planning shall be in conformance with CPS Nutrient Management, Code 590. The amendment successfully addresses the air quality impacts of objectionable odors, ammonia emissions, PM and PM precursors and bird health resource concerns.

Feature Measure: Number of 1000SF applications per

Scenario Unit: 1,000 Square Foot

Scenario Typical Size: 160.0

Scenario Total Cost: $4,738.96

Scenario Cost/Unit: $29.62

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Application of ag waste amendment for poultry litter	2020	Litter amendment application performed in house. Includes equipment, power unit and labor costs.	Ton	$52.37	8	$418.96
Materials						
Ag Waste Amendment, sodium bisulfate	1686	Sodium bisulfate poultry litter amendment. NRCS approved for air quality concerns to reduce ammonia emissions from the litter. Includes materials only.	Ton	$540.00	8	$4,320.00

Practice: 591 - Amendments for Treatment of Agricultural Waste

Scenario: #4 - Litter Amendments applied on a %w/w basis for Water Quality Impacts

Scenario Description:

This practice scenario includes the application of a litter treatment amendment that is approved by NRCS to the entire poultry house to reduce water-soluble phosphorous in the poultry litter by a specified percentage. The amendment used is proven to transform nitrogen into a form of ammonium and reduce the concentration of water-soluble phosphorous in the litter and reduces ammonia levels in the house. Resource concerns from existing nutrient levels may contribute to water quality degradation from nutrient runoff and leaching from fields fertilized with poultry litter and air quality impacts such as objectionable odors and ammonia emissions. Associated practices: Nutrient Management (590).

Before Situation:

Integrator does not currently apply waste treatment amendments to the litter that reduce ammonia emissions and soluble phosphorus.

After Situation:

This scenario is based on a typical poultry operation with a desired application rate is 10% by weight of the litter (10%w/w) of a phosphorus binding amendment. Typical operation consists of 2 houses, 40' x 400' house (16,000 SF), 20,000 birds (4 pound finished bird weight), 0.5 lb litter/bird (assume 54 pounds P205/Ton of litter). The operation raises 5 flocks per year. Formula to calculate required amendment at the prescribed rate in tons per year is: (Number of birds) X (Finish weight of birds (lbs)) X (Pounds of litter)/bird) X (Number of houses) X (application rate) X (Number of applications per year) / 2000 pounds/ton 20,000 birds X 4 lb bird X 0.50 lb litter/bird X 2 houses X 0.10 lb amendment/lb litter X 5 app/year / 2000 lb/ton = 20 tons/year. An NRCS approved amendment is applied between each flock at the prescribed rate. The selected amendment is applied in conformance with the manufacturer's recommendations and the rates required. The amendment is proven to reduce soluble phosphorus in the litter, to control the odor, and to reduce ammonia emissions. The resulting litter contains higher levels of nutrients and nutrient management plans must account for this. Nutrient level testing of the litter and nutrient planning shall be in conformance with CPS Nutrient Management, Code 590. The amendment successfully addresses water quality degradation due to nutrients in surface and ground water and air quality impacts from objectionable odors, ammonia emissions, PM and PM precursors and bird health resource concerns.

Feature Measure: Tons of amendment per year.

Scenario Unit: Ton

Scenario Typical Size: 20.0

Scenario Total Cost: $8,947.40

Scenario Cost/Unit: $447.37

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Application of ag waste amendment for poultry litter	2020	Litter amendment application performed in house. Includes equipment, power unit and labor costs.	Ton	$52.37	20	$1,047.40
Materials						
Ag Waste Amendment, aluminum sulfate, alum	1684	Aluminum sulfate, alum, poultry Litter amendment. NRCS approved for air and water quality concerns to reduce ammonia emissions and soluble phosphorus in the litter. Materials only.	Ton	$395.00	20	$7,900.00

Practice: 591 - Amendments for Treatment of Agricultural Waste

Scenario: #7 - Zeolite for Ammonia Reduction

Scenario Description:
Application of bulk zeolite to a beef or dairy pen surface to reduce ammonia emissions.

Before Situation:
Zeolite is not added to a beef or dairy open lot pen surface, resulting in loss of nitrogen via ammonia volatilization.

After Situation:
Bulk zeolite is added to a beef or dairy open lot pen surface. Zeolite is applied at a rate of 4-6% of the anticipated weight of manure produced over the period of time animals are housed in the pen. The zeolite will adsorb ammonia and other compounds, resulting in lower ammonia emissions and resultant air quality improvement.

Feature Measure: Number of 1000 SF applications per

Scenario Unit: 1,000 Square Foot

Scenario Typical Size: 30.0

Scenario Total Cost: $16,923.74

Scenario Cost/Unit: $564.12

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	0.7	$3.74
Materials						
Zeolite, Bulk	2683	Zeolite applied as a pen surface amendment or used as a feed ingredient. Zeolite is added to feed as a nutrition-based strategies or applied to pen surface as an ammonia abatement measures in livestock production, means of reducing ammonia emissions from concentrated animal feeding operations.	Ton	$376.00	45	$16,920.00

Practice: 592 - Feed Management

Scenario: #11 - Zeolite as a Feed Additive for Ammonia Reduction

Scenario Description:
Inclusion of zeolite as a feed additive in beef or dairy rations to reduce ammonia emissions.

Before Situation:
Zeolite is not added to a beef or dairy ration, resulting in loss of nitrogen via ammonia volatilization from the manure.

After Situation:
Zeolite is added to a beef or dairy ration at a rate of 2% of the daily ration. The zeolite will adsorb ammonia and other compounds, resulting in lower nitrogen excretion and thus lower ammonia emissions from the manure and resultant air quality improvement.

Feature Measure: Animal Unit treated

Scenario Unit: Animal Unit

Scenario Typical Size: 1.0

Scenario Total Cost: $61.79

Scenario Cost/Unit: $61.79

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	1	$24.19
Materials						
Zeolite, Bulk	2683	Zeolite applied as a pen surface amendment or used as a feed ingredient. Zeolite is added to feed as a nutrition-based strategies or applied to pen surface as an ammonia abatement measures in livestock production, means of reducing ammonia emissions from concentrated animal feeding operations.	Ton	$376.00	0.1	$37.60

Practice: 592 - Feed Management

Scenario: #28 - Animal Group

Scenario Description:

Feed ration management on an animal operation that does not have access to enough acres to spread all of its manure nutrients at an agronomic rate. The resource concerns are water quality degradation, excessive manure nutrients, particularly nitrogen and phosphorus. The goal of the practice is to reduce the amount of nutrients in the raw manure so that it is easier for “landlocked” farmers to apply the manure at agronomic rates, thereby reducing or eliminating water quality degradation concerns. Associated practices: Nutrient Management (590), Prescribed Grazing (528), Forage Harvest Management (511).

Before Situation:

Producer is feeding a higher level of protein and/or phosphorus than is needed to meet National Research Council (NRC) recommendations for a group of animals of this type and at this stage of production. The operation does not have all of the available acres that it needs to use the nutrients in the manure when spread at agronomic rates causing over application of nutrients on land affecting soil quality, which may lead to water quality degradation.

After Situation:

The scenario assumes that a specific group of animals is being evaluated. A baseline analysis of 4 samples each with 4 quarterly reports of manure, and feed will be completed to determine the current inputs and outputs. The producer will reduce feed protein and phosphorus levels to that of NRC recommendations for a group of animals of this type and at this stage of production. The producer will explore alternative feedstuffs and alternative feeding strategies to bring manure nitrogen and/or phosphorus levels down without hurting production of the animals or profitability of the operation. Alternative feeding strategies can include such things as grouping animals by similar age, sex, or stage of production, feeding based on individual rolling average production, or feeding “homegrown” or local feedstuffs.

Feature Measure: Group

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $3,888.92

Scenario Cost/Unit: $3,888.92

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	24	$580.56
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	20	$2,224.20
Materials						
Test, Manure Analysis	306	Moisture, Total N, P, K. Includes materials and shipping only.	Each	$40.16	16	$642.56
Test, Feed Analysis	1989	Representative sample of feed. Includes materials and shipping only.	Each	$27.60	16	$441.60

Practice: 592 - Feed Management

Scenario: #44 - Feed Additive

Scenario Description:

Feed ration management on an animal operation by inclusion of a feed additive. The resource concerns may be water quality degradation (pathogens, soluble nutrients), air quality (odors, green house gas). The goal of the practice is to add an approved feed additive that has been proven to reduce pathogens, or tie up soluble nutrients, or improve air quality by reducing odors, ammonia, or green house gases to the animal diet. For this scenario, zeolite will be added to beef and dairy rations to reduce ammonia emissions. Associated practices: Nutrient Management (590).

Before Situation:

Producer is feeding a balanced diet to his animals. He knows that the diet, however is leading to resource concerns by soluble nutrients or pathogens entering the surface water from his operation, or that odors, NOx, or Methane are affecting air quality. For this scenario, the producer knows that nitrogen loss via ammonia volatilization from manure is affecting air quality and that adding zeolite to the ration will decrease this effect and improve air quality for his animals.

After Situation:

The scenario assumes that a specific group of animals is being evaluated for a resource concern, and that a proven feed additive can have an effect on that concern. For this particular scenario, a zeolite is added to a beef or dairy ration at a rate of 2% of the daily ration. The zeolite will absorb ammonia and other compounds, resulting in lower nitrogen excretion and thus lower ammonia emissions from the manure and result in improved air quality. Assume that one hour of general labor will be needed per year per animal unit to load/unload zeolite into feed mixing equipment. Assume that the zeolite is added based on a 2% inclusion rate of the dry matter ration of 25 pounds/day/animal unit or the amount of zeolite needed is 0.5 pounds/day/animal unit or about 0.1 tons/year/animal unit.

Feature Measure: Per Animal unit, per year

Scenario Unit: Animal Unit

Scenario Typical Size: 1.0

Scenario Total Cost: $61.79

Scenario Cost/Unit: $61.79

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	1	$24.19
Materials						
Zeolite, Bulk	2683	Zeolite applied as a pen surface amendment or used as a feed ingredient. Zeolite is added to feed as a nutrition-based strategies or applied to pen surface as an ammonia abatement measures in livestock production, means of reducing ammonia emissions from concentrated animal feeding operations.	Ton	$376.00	0.1	$37.60

Practice: 595 - Pest Management Conservation System

Scenario: #84 - Plant Health PAMS (acs) Low Labor and Materials

Scenario Description:

PAMS activities with low labor and material costs will be implemented on a large scale crop production area.

Before Situation:

Before practice conditions vary widely. Conditions range from the client is not using any PAMS techniques to the client is using many different PAMS techniques for many different pests. In all cases at least one planned PAMS technique has risk to an identified resource concern (Plant Pest Pressure).

After Situation:

Planned Prevention (resistant cultivar selection, etc.), Avoidance (IWM for disease avoidance, change in rotation to avoid problem spots, etc.), and Monitoring (Degree day monitoring, field scouting, etc.) activities have been implemented to help meet the minimum criteria for the identified resource concerns (i.e. Plant Pest Pressure).

Feature Measure: Acres of Management Applied

Scenario Unit: Acres

Scenario Typical Size: 40.0

Scenario Total Cost: $873.81

Scenario Cost/Unit: $21.85

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$109.25	1	$109.25
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	2	$68.24
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	8	$193.52
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	2	$222.42
Materials						
Miscellaneous, containers, traps, etc.	298	Pheromone Traps, Culture container with lid. Includes materials and shipping only.	Each	$4.84	10	$48.40
Weather Station, Basic	314	Basic Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, and temperature to a home weather console. Includes materials only.	Each	$231.98	1	$231.98

Practice: 595 - Pest Management Conservation System

Scenario: #85 - Plant Health PAMS (acs) Low labor only

Scenario Description:
PAMS activities with low labor costs will be implemented on a large scale crop production area.

Before Situation:
Before practice conditions vary widely. Conditions range from the client is not using any PAMS techniques to the client is using many different PAMS techniques for many different pests. In all cases at least one planned PAMS technique has risk to an identified resource concern (Plant Pest Pressure).

After Situation:
Planned Prevention (resistant cultivar selection, pest habitat removal, etc.), Avoidance (IWM for disease avoidance, change in rotation to avoid problem spots, etc.), and Monitoring (field scouting, etc.) activities have been implemented to help meet the minimum criteria for the identified resource concerns (i.e. Plant Pest Pressure).

Feature Measure: Acres of management applied

Scenario Unit: Acres

Scenario Typical Size: 40.0

Scenario Total Cost: $593.43

Scenario Cost/Unit: $14.84

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$109.25	1	$109.25
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	2	$68.24
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	8	$193.52
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	2	$222.42

Practice: 595 - Pest Management Conservation System

Scenario: #86 - Pest Management Precision Ag

Scenario Description:

This scenario takes a conventional cropping system where either no pest management or only a basic level of pest management is being practiced and improves it to address air quality and/or minimize agricultural nonpoint sources pollution of surface and groundwater. The planned Pest Management system will meet the current Pest Management Conservation System (595) CPS general and additional criteria. Precision pest management system includes such items as pest monitoring, targeted applications, eliminates overlap, tissue testing, specialized nozzles etc. to further refine pesticide applications. Payment for implementation is to defray the costs of tissue testing, additional testing and analysis, equipment implementation of the PMCS and recordkeeping. Typical treatment area is 40 acres.

Before Situation:

Conventional pest management programs involve little or no monitoring and testing. Application of pesticides are completed annually based upon product salesmen recommendations that do not specifically consider the detrimental affects of inexact application methods. Fields are overwintered with little or no erosion protection often resulting in sheet, rill and ephemeral erosion. Runoff flows into adjacent streams, water courses, tile drains, field surface drains or other water courses causing degradation to receiving waters or leaching of pesticides to shallow ground water sources. There is typically no environmental evaluation of the potential for off-site movement. Soil health may also be detrimentally affected.

After Situation:

A precision pest management system will be developed to meet the current Pest Management Conservation System (595) CPS general and additional criteria, when applicable the system will also meet NOP regulations. Development and implementation of a PMCS will benefit plant productivity while reducing potential of off-site movement of pesticides. PMCS may include practices such as use of spot applications, proper timing of applications, more appropriate formulations etc. Additional monitoring and tissue testing may also be used to further refine pesticide applications. Smart sprayer and advanced nozzle technology may also be employed. Records will be provided annually of the current monitoring, test analysis, application rates, formulations for each field including crop yields.

Feature Measure: Acres of management applied

Scenario Unit: Acres

Scenario Typical Size: 40.0

Scenario Total Cost: $2,415.36

Scenario Cost/Unit: $60.38

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	4	$89.16
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$19.49	8	$155.92
Satellite imagery, aerial photography, infrared	966	Infrared imagery	Acres	$0.20	40	$8.00
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	8	$272.96
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	12	$290.28
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	14	$1,556.94
Materials						
Miscellaneous, containers, traps, etc.	298	Pheromone Traps, Culture container with lid. Includes materials and shipping only.	Each	$4.84	4	$19.36
Test, Plant Tissue Test	301	Tissue analysis for crops. Includes materials and shipping only.	Each	$22.74	1	$22.74

Practice: 595 - Pest Management Conservation System

Scenario: #87 - Plant Health PAMS activities (Small Farm - each) labor, materials and mitigation.

Scenario Description:

PAMS activities with labor and material costs plus mitigation will be implemented on a small scale crop production area.

Before Situation:

Before practice conditions vary widely. Conditions range from the client is not using any PAMS techniques to the client is using many different PAMS techniques for many different pests. In all cases at least one planned PAMS technique has risk to an identified resource concern (Plant Pest Pressure). Mitigation over 30 points.

After Situation:

Planned Prevention (Netting to exclude insect or birds, resistant cultivar selection, etc.), Avoidance (IWM for disease avoidance, change in rotation to avoid problem spots, etc.), and Monitoring (Degree day monitoring, field scouting, etc.) activities have been implemented to help meet the minimum criteria for the identified resource concerns (i.e. Plant Pest Pressure). Mitigation over 30 points.

Feature Measure: Small farm, typically = 5Ac

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $7,717.08

Scenario Cost/Unit: $7,717.08

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$109.25	1	$109.25
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	27	$921.24
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	8	$193.52
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	17	$1,890.57
Materials						
Miscellaneous, containers, traps, etc.	298	Pheromone Traps, Culture container with lid. Includes materials and shipping only.	Each	$4.84	3	$14.52
Weather Station, Basic	314	Basic Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, and temperature to a home weather console. Includes materials only.	Each	$231.98	1	$231.98
Netting, Crop Protection, Large Mesh	2762	Synthetic netting, large mesh to exclude birds and small animals. Approximately 6 t0 7 inch mesh. Includes materials and shipping only.	Square Feet	$0.05	87120	$4,356.00

Practice: 595 - Pest Management Conservation System

Scenario: #88 - Plant Health PAMS (acs) High labor only (intensive scouting etc.)

Scenario Description:
Plant Health PAMS (acs) High labor only (intensive scouting etc.)

Before Situation:
Before practice conditions vary widely. Conditions range from the client is not using any PAMS techniques to the client is using many different PAMS techniques for many different pests. In all cases at least one planned PAMS technique has risk to an identified resource concern (Plant Pest Pressure).

After Situation:
Planned Prevention (resistant cultivar selection, pest habitat removal, etc.), Avoidance (IWM for disease avoidance, change in rotation to avoid problem spots, etc.), and Monitoring (field scouting, etc.) activities have been implemented to help meet the minimum criteria for the identified resource concerns (i.e. Plant Pest Pressure).

Feature Measure: Acres of Management Applied

Scenario Unit: Acres

Scenario Typical Size: 40.0

Scenario Total Cost: $1,841.25

Scenario Cost/Unit: $46.03

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$109.25	1	$109.25
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	2	$68.24
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	32	$774.08
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	8	$889.68

Practice: 595 - Pest Management Conservation System

Scenario: #89 - Plant health PAMS (Small Farm - each) labor and mitigation.

Scenario Description:

PAMS activities with labor costs will be implemented plus mitigation on a small scale crop production area.

Before Situation:

Before practice conditions vary widely. Conditions range from the client is not using any PAMS techniques to the client is using many different PAMS techniques for many different pests. In all cases at least one planned PAMS technique has risk to an identified resource concern (Plant Pest Pressure). Mitigation up to 30 points.

After Situation:

Planned Prevention (resistant cultivar selection, pest habitat removal, etc.), Avoidance (IWM for disease avoidance, change in rotation to avoid problem spots, etc.), and Monitoring (field scouting, etc.) activities have been implemented to help meet the minimum criteria for the identified resource concerns (i.e. Plant Pest Pressure). Mitigation up to 30 points.

Feature Measure: Small farm, typically = 5Ac

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $1,781.34

Scenario Cost/Unit: $1,781.34

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$109.25	1	$109.25
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	14	$477.68
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	8	$193.52
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	9	$1,000.89

Practice: 595 - Pest Management Conservation System

Scenario: #90 - Plant Health PAMS (acs) High Labor, materials and mitigation.

Scenario Description:

PAMS activities with high labor and material costs (weather station, netting, field sanitation, mating disruption) plus mitigation will be implemented on a large scale crop production area.

Before Situation:

Before practice conditions vary widely. Conditions range from the client is not using any PAMS techniques to the client is using many different PAMS techniques for many different pests. In all cases at least one planned PAMS technique has risk to an identified resource concern (Plant Pest Pressure). Mitigation over 30 points.

After Situation:

Planned Prevention (Netting to exclude insect or birds, resistant cultivar selection, etc.), Avoidance (IWM for disease avoidance, change in rotation to avoid problem spots, etc.), and Monitoring (Degree day monitoring, field scouting, etc.) activities have been implemented to help meet the minimum criteria for the identified resource concerns (i.e. Plant Pest Pressure). Mitigation over 30 points.

Feature Measure: Acres of management applied

Scenario Unit: Acres

Scenario Typical Size: 40.0

Scenario Total Cost: $15,899.50

Scenario Cost/Unit: $397.49

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$109.25	1	$109.25
Equipment Installation						
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$46.88	150	$7,032.00
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	15	$511.80
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	150	$3,628.50
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	30	$1,360.20
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	22	$2,446.62
Materials						
Weather Station, Advanced	2550	Advance Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, temperature, and solar radiation from a solar powered self-standing tripod to an advance weather recording console. Used for both 449 advance irrigation water management and for Activity 202 water quality monitoring .	Each	$811.13	1	$811.13

Practice: 595 - Pest Management Conservation System

Scenario: #91 - Plant Health PAMS (acs) Low Labor, materials and mitigation.

Scenario Description:

PAMS activities with low labor and material costs will be implemented plus mitigation on a large scale crop production area.

Before Situation:

Before practice conditions vary widely. Conditions range from the client is not using any PAMS techniques to the client is using many different PAMS techniques for many different pests. In all cases at least one planned PAMS technique has risk to an identified resource concern (Plant Pest Pressure). Mitigation up to 30 points.

After Situation:

Planned Prevention (Netting to exclude insect or birds, resistant cultivar selection, etc.), Avoidance (IWM for disease avoidance, change in rotation to avoid problem spots, etc.), and Monitoring (Degree day monitoring, field scouting, etc.) activities have been implemented to help meet the minimum criteria for the identified resource concerns (i.e. Plant Pest Pressure). Mitigation up to 30 points.

Feature Measure: Acres of Management Applied

Scenario Unit: Acres

Scenario Typical Size: 40.0

Scenario Total Cost: $2,413.05

Scenario Cost/Unit: $60.33

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$109.25	1	$109.25
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	8	$272.96
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	8	$193.52
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	14	$1,556.94
Materials						
Miscellaneous, containers, traps, etc.	298	Pheromone Traps, Culture container with lid. Includes materials and shipping only.	Each	$4.84	10	$48.40
Weather Station, Basic	314	Basic Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, and temperature to a home weather console. Includes materials only.	Each	$231.98	1	$231.98

Practice: 595 - Pest Management Conservation System

Scenario: #92 - Water Quality Pesticide Mitigation > 30 Point AND/OR Beneficial Insect Pesticide Mitigation - Small Farm

Scenario Description:

The minimum amount of planned IPM mitigation techniques needed to reduce water quality pesticide-related resource concerns is > 30 mitigation index score. An IPM plan will be developed in accordance with this standard and the CPS 595 Implementation Requirement will document how specific pesticide hazards will be prevented or mitigated AND/OR impacts to wildlife-beneficial insects including pollinators.

Before Situation:

Before practice conditions vary widely. Conditions range from the client is not using many pest suppression techniques (pesticides, tillage for weed control, burning, etc.) to the client is using many different pest suppression techniques for many different pests, but in all cases at least one planned pest suppression technique has risk to an identified resource concern (e.g. Water Quality - Impacts to Human Drinking Water AND/OR Wildlife-beneficial insects including pollinators).

After Situation:

An IPM system with planned. Mitigation techniques (>30 points) have been implemented to meet the minimum criteria for the identified resource concerns (i.e. Water Quality - Impacts to Human Drinking Water or Fish) AND 10 points of mitigation for Wildlife (beneficial insects including pollinators) with either risk prevention (i.e. planned pesticides have no risk to the identified resource concern) or risk mitigation (i.e. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 AND Agronomy Technical Note 9).

Feature Measure: Small Farm, typically <= 5 acs

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $1,905.71

Scenario Cost/Unit: $1,905.71

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	20	$682.40
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	11	$1,223.31

Practice: 595 - Pest Management Conservation System

Scenario: #93 - Plant Health PAMS (acs) High Labor and materials

Scenario Description:

PAMS activities with high labor and material costs will be implemented on a large scale crop production area (weather station, netting, field sanitation, mating disruption etc.).

Before Situation:

Before practice conditions vary widely. Conditions range from the client is not using any PAMS techniques to the client is using many different PAMS techniques for many different pests. In all cases at least one planned PAMS technique has risk to an identified resource concern (Plant Pest Pressure).

After Situation:

Planned Prevention (Netting to exclude insect or birds, resistant cultivar selection, etc.), Avoidance (IWM for disease avoidance, change in rotation to avoid problem spots, etc.), and Monitoring (Degree day monitoring, field scouting, etc.) activities have been implemented to help meet the minimum criteria for the identified resource concerns (i.e. Plant Pest Pressure).

Feature Measure: Acres of Management Applied

Scenario Unit: Acres

Scenario Typical Size: 40.0

Scenario Total Cost: $13,830.76

Scenario Cost/Unit: $345.77

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$109.25	1	$109.25
Equipment Installation						
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$46.88	150	$7,032.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	150	$3,628.50
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	30	$1,360.20
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	8	$889.68
Materials						
Weather Station, Advanced	2550	Advance Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, temperature, and solar radiation from a solar powered self-standing tripod to an advance weather recording console. Used for both 449 advance irrigation water management and for Activity 202 water quality monitoring .	Each	$811.13	1	$811.13

Practice: 595 - Pest Management Conservation System

Scenario: #94 - Water Quality Pesticide Mitigation = 30 Point AND/OR Beneficial Insect Pesticide Mitigation - Small Farm

Scenario Description:

The minimum amount of planned IPM mitigation techniques needed to reduce water quality pesticide-related resource concerns is = 30 mitigation index score. An IPM plan will be developed in accordance with this standard and the CPS 595 Implementation Requirement will document how specific pesticide hazards will be prevented or mitigated AND/OR impacts to wildlife-beneficial insects including pollinators.

Before Situation:

Before practice conditions vary widely. Conditions range from the client is not using many pest suppression techniques (pesticides, tillage for weed control, burning, etc.) to the client is using many different pest suppression techniques for many different pests, but in all cases at least one planned pest suppression technique has risk to an identified resource concern (e.g. Water Quality - Impacts to Human Drinking Water AND/OR Wildlife-beneficial insects including pollinators).

After Situation:

An IPM system with planned. Mitigation techniques (=30 points) have been implemented to meet the minimum criteria for the identified resource concerns (i.e. Water Quality - Impacts to Human Drinking Water or Fish) AND/OR 10 points of mitigation for Wildlife (beneficial insects including pollinators) with either risk prevention (i.e. planned pesticides have no risk to the identified resource concern) or risk mitigation (i.e. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 AND/OR Agronomy Technical Note 9).

Feature Measure: Small Farm, typically <= 5 acres

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $1,144.94

Scenario Cost/Unit: $1,144.94

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	14	$477.68
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	6	$667.26

Practice: 595 - Pest Management Conservation System

Scenario: #95 - Water Quality Pesticide Mitigation > 30 Point AND/OR Beneficial Insect Pesticide Mitigation

Scenario Description:

The minimum amount of planned IPM mitigation techniques needed to reduce water quality pesticide-related resource concerns is > 30 mitigation index score. An IPM plan will be developed in accordance with this standard and the CPS 595 Implementation Requirement will document how specific pesticide hazards will be prevented or mitigated AND/OR impacts to wildlife-beneficial insects including pollinators.

Before Situation:

Before practice conditions vary widely. Conditions range from the client is not using many pest suppression techniques (pesticides, tillage for weed control, burning, etc.) to the client is using many different pest suppression techniques for many different pests, but in all cases at least one planned pest suppression technique has risk to an identified resource concern (e.g. Water Quality - Impacts to Human Drinking Water AND/OR Wildlife-beneficial insects including pollinators).

After Situation:

An IPM system with planned. Mitigation techniques (>30 points) have been implemented to meet the minimum criteria for the identified resource concerns (i.e. Water Quality - Impacts to Human Drinking Water or Fish) AND/OR 10 points of mitigation for Wildlife (beneficial insects including pollinators) with either risk prevention (i.e. planned pesticides have no risk to the identified resource concern) or risk mitigation (i.e. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 AND/OR Agronomy Technical Note 9).

Feature Measure: Acres of Management Applied

Scenario Unit: Acres

Scenario Typical Size: 40.0

Scenario Total Cost: $2,736.00

Scenario Cost/Unit: $68.40

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	15	$511.80
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	20	$2,224.20

Practice: 595 - Pest Management Conservation System

Scenario: #96 - Water Quality Pesticide Mitigation = 30 Point AND/OR Beneficial Insect Pesticide Mitigation

Scenario Description:

The minimum amount of planned IPM mitigation techniques needed to reduce water quality pesticide-related resource concerns is = 30 mitigation index score. An IPM plan will be developed in accordance with this standard and the CPS 595 Implementation Requirement will document how specific pesticide hazards will be prevented or mitigated AND/OR impacts to wildlife-beneficial insects including pollinators.

Before Situation:

Before practice conditions vary widely. Conditions range from the client is not using many pest suppression techniques (pesticides, tillage for weed control, burning, etc.) to the client is using many different pest suppression techniques for many different pests, but in all cases at least one planned pest suppression technique has risk to an identified resource concern (e.g. Water Quality - Impacts to Human Drinking Water AND/OR Wildlife-beneficial insects including pollinators).

After Situation:

An IPM system with planned. Mitigation techniques (=30 points) have been implemented to meet the minimum criteria for the identified resource concerns (i.e. Water Quality - Impacts to Human Drinking Water or Fish) AND/OR 10 points of mitigation for Wildlife (beneficial insects including pollinators) with either risk prevention (i.e. planned pesticides have no risk to the identified resource concern) or risk mitigation (i.e. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 AND Agronomy Technical Note 9).

Feature Measure: Acres of Management Applied

Scenario Unit: Acres

Scenario Typical Size: 40.0

Scenario Total Cost: $1,573.36

Scenario Cost/Unit: $39.33

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	7	$238.84
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	12	$1,334.52

Practice: 595 - Pest Management Conservation System

Scenario: #97 - Plant health PAMS (Small Farm - each) labor only

Scenario Description:

PAMS activities with labor costs will be implemented on a small scale crop production area.

Before Situation:

Before practice conditions vary widely. Conditions range from the client is not using any PAMS techniques to the client is using many different PAMS techniques for many different pests. In all cases at least one planned PAMS technique has risk to an identified resource concern (Plant Pest Pressure).

After Situation:

Planned Prevention (resistant cultivar selection, pest habitat removal, etc.), Avoidance (IWM for disease avoidance, change in rotation to avoid problem spots, etc.), and Monitoring (field scouting, etc.) activities have been implemented to help meet the minimum criteria for the identified resource concerns (i.e. Plant Pest Pressure).

Feature Measure: Small farm, typically <= 5 ac

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $559.31

Scenario Cost/Unit: $559.31

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$109.25	1	$109.25
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	1	$34.12
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	8	$193.52
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	2	$222.42

Practice: 595 - Pest Management Conservation System

Scenario: #98 - Plant Health PAMS activities (Small Farm - each) labor and materials

Scenario Description:

PAMS activities with labor and material costs will be implemented on a small scale crop production area.

Before Situation:

Before practice conditions vary widely. Conditions range from the client is not using any PAMS techniques to the client is using many different PAMS techniques for many different pests. In all cases at least one planned PAMS technique has risk to an identified resource concern (Plant Pest Pressure).

After Situation:

Planned Prevention (Netting to exclude insect or birds, resistant cultivar selection, etc.), Avoidance (IWM for disease avoidance, change in rotation to avoid problem spots, etc.), and Monitoring (Degree day monitoring, field scouting, etc.) activities have been implemented to help meet the minimum criteria for the identified resource concerns (i.e. Plant Pest Pressure).

Feature Measure: Small Farm, typically <= 5 ac

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $5,161.81

Scenario Cost/Unit: $5,161.81

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$109.25	1	$109.25
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	1	$34.12
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	8	$193.52
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	2	$222.42
Materials						
Miscellaneous, containers, traps, etc.	298	Pheromone Traps, Culture container with lid. Includes materials and shipping only.	Each	$4.84	3	$14.52
Weather Station, Basic	314	Basic Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, and temperature to a home weather console. Includes materials only.	Each	$231.98	1	$231.98
Netting, Crop Protection, Large Mesh	2762	Synthetic netting, large mesh to exclude birds and small animals. Approximately 6 t0 7 inch mesh. Includes materials and shipping only.	Square Feet	$0.05	87120	$4,356.00

Practice: 600 - Terrace

Scenario: #1 - Broadbased

Scenario Description:

An earthen embankment with channel constructed across the field slope as part of a system to shorten slope lengths and reduce sheet, rill, and gully erosion in a cropped field. The typical installation is a broadbased terrace having 5:1 upstream and 5:1 downstream slopes measuring 2,500 feet in a field with slopes from 2% to 8% constructed in loam soils or similar in regards to workability. Channel and berm are farmed. A stable outlet is provided in the form of a Grassed Waterway or Underground Outlet. Costs include all equipment and forces necessary to excavate, shape, and compact terrace. This practice addresses Concentrated Flow Erosion and Excessive Sediment in surface waters.

Before Situation:

Long slope lengths contribute to excessive sedimentation and soil erosion in cropped fields as a result of gully, rill, and sheet erosion. The excessive erosion may lead to deterioration of receiving waters due to excessive sedimentation and nutrient transport.

After Situation:

A system of broadbased terraces measuring 2,500 feet in length, 2.5 height, and 5:1 front and back slopes is installed with spacing designed to intercept flow of water and shorten slope length to reduce erosion to acceptable levels. Work is done with dozer, scraper, or road grader. The installed terrace is typically farmed. Associated practices are Critical Area Planting (342), Grassed Waterway (412), and Underground Outlet (620).

Feature Measure: Length of Terrace

Scenario Unit: Feet

Scenario Typical Size: 2,500.0

Scenario Total Cost: $4,937.61

Scenario Cost/Unit: $1.98

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$96.65	34	$3,286.10
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	34	$1,143.76
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	6	$272.04
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 600 - Terrace

Scenario: #2 - Flat Channel

Scenario Description:

An earthen embankment with channel constructed across the field slope as part of a system to shorten slope lengths, and reduce sheet, rill, and gully erosion in a cropped field. The typical installation is a flat channel (level) terrace storing runoff with a length of 2,500 feet and side slopes of 8:1 or greater in a field with slopes from 2% to 8% constructed in loam soils or similar in regards to workability. Costs include all equipment and forces necessary to excavate, shape, and compact terrace. This practice addresses Concentrated Flow Erosion and Excessive Sediment in surface waters.

Before Situation:

Long slope lengths contribute to excessive sedimentation and soil erosion in cropped fields as a result of gully, rill, and sheet erosion. The excessive erosion may lead to deterioration of receiving waters due to excessive sedimentation and nutrient transport.

After Situation:

A system of flat channel (level) terraces with approximately 8:1 front and back slopes, 2.5 feet height, and 2,500 feet in length is installed with spacing designed to intercept flow of water and shorten slope length to reduce erosion to acceptable levels. Work is done with dozer, scraper, or road grader. The installed terrace is typically farmed. Associated practices are Critical Area Planting (342), Grassed Waterway (412), and Underground Outlet (620).

Feature Measure: Length of Terrace

Scenario Unit: Feet

Scenario Typical Size: 2,500.0

Scenario Total Cost: $8,024.96

Scenario Cost/Unit: $3.21

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$96.65	57	$5,509.05
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	57	$1,917.48
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	8	$362.72
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 601 - Vegetative Barrier

Scenario: #2 - Seeded Barrier

Scenario Description:
Permanent strips of stiff, dense vegetation established along the general contour of slopes.

Before Situation:
Significant erosion is occurring resulting in substantial transport of sediment across the slope. A large amount of sediment is subsequently delivered to the edge of the field and/or waterways.

After Situation:
Implementation Requirements are prepared and implemented for the site according to the Vegetative Barrier (601) standard. A strip or strips of stiff, dense vegetation is established by seeding along the general contour of the slope that effectively settles a significant amount of sediment above the leading edge of the vegetative barrier. Barrier may also help to connect green areas to provide shelter for wildlife.

Feature Measure: Per 1000 Linear feet of practice inst

Scenario Unit: Feet

Scenario Typical Size: 1,000.0

Scenario Total Cost: $171.99

Scenario Cost/Unit: $0.17

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	0.09	$0.89
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	0.09	$1.83
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acres	$8.00	0.09	$0.72
Materials						
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$111.33	0.09	$10.02
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53

Practice: 601 - Vegetative Barrier

Scenario: #3 - Vegetative Planting

Scenario Description:

Permanent strips of stiff, dense vegetation established along the general contour of slopes.

Before Situation:

Significant erosion is occurring resulting in substantial transport of sediment across the slope. A large amount of sediment is subsequently delivered to the edge of the field and/or waterways.

After Situation:

Implementation Requirements are prepared and implemented for the site according to the Vegetative Barrier (601) standard. A strip or strips of stiff, dense vegetation such as Vetiver Grass is/are established along the general contour of the slope that effectively settles a significant amount of sediment above the leading edge of the vegetative barrier. Barrier may also help to connect green areas to provide shelter for wildlife.

Feature Measure: Per 100 foot Linear feet of practice

Scenario Unit: Feet

Scenario Typical Size: 100.0

Scenario Total Cost: $105.53

Scenario Cost/Unit: $1.06

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	0.01	$0.05
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.12	0.01	$0.06
Ground sprigging	1101	Includes costs for equipment, power unit and labor.	Acres	$57.71	0.01	$0.58
Materials						
Nitrogen (N), Ammonium Sulfate	70	Price per pound of N supplied by Ammonium Sulfate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.80	0.46	$0.37
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$9.21	0.01	$0.09
Perennial Grass, Legume, and/or Forb Culms, Stems, Liners, or Plugs, linear planting	2324	Perennial grasses, legumes and/or forbs established in a row using vegetative propagules including culms, stems, liners, or plugs. Cost is for 100 linear feet. Includes materials and shipping.	100 Foot	$104.38	1	$104.38

Practice: 603 - Herbaceous Wind Barriers

Scenario: #1 - Cool Season Annual/Perennial Species

Scenario Description:

This scenario describes the implementation of herbaceous barriers to reduce wind velocities and wind-borne particulate matter. In this scenario barriers are composed of cool season annual or perennial vegetation. Plant materials shall be selected for local adaptation and climatic conditions and are resistant to lodging and are non-spreading in their habit. Barriers will be designed as close to perpendicular to prevailing winds as practical. Barrier direction, spacing, and composition needed to achieve the desired purpose shall be designed using the currently approved wind erosion technology.

Before Situation:

Typically cropland has excessive soil disturbance and unsheltered distance that results in excessive wind erosion that affect soil resources. Seedling development and wildlife habitat are negatively affected by wind-borne sediment and sediment-borne contaminants travelling offsite.

After Situation:

Implementation Requirements will be prepared and implemented for the site according to the Herbaceous Wind Barrier (603) standard. Implementation of herbaceous wind barriers will modify the flow and velocity of air dependent upon barrier height, porosity, spacing and wind speed. Orientation is generally placed across an entire field perpendicular to applicable prevailing wind direction. Implementation will reduce soil loss, protect growing plants from damage by wind-blown soil particles, and provide food and cover for wildlife. The scenario includes the design and implementation of annual barriers and required reestablishment.

Feature Measure: linear feet of barrier planted

Scenario Unit: Linear Feet

Scenario Typical Size: 1,320.0

Scenario Total Cost: $116.20

Scenario Cost/Unit: $0.09

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	2	$44.58
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	1	$20.31
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	2	$48.38
Materials						
Annual Grasses	2730	Annual grasses, one or more species, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$32.58	0.09	$2.93

Practice: 603 - Herbaceous Wind Barriers

Scenario: #6 - Small Farm Herbaceous Barrier

Scenario Description:

This scenario describes the annual implementation of herbaceous barriers to reduce wind velocities and wind-borne particulate matter. In this scenario barriers are composed of annual living vegetation. Plant materials shall be selected for local adaptation and climatic conditions and are resistant to lodging and are non-spreading in their habit. Barriers will be designed as close to perpendicular to prevailing winds as practical. Barrier direction, spacing, and composition needed to achieve the desired purpose shall be designed using the currently approved wind erosion technology. Establishment is done either by using light tillage or chemical application and no till drill.

Before Situation:

Typically cropland has excessive soil disturbance and un-sheltered distance that results in excessive wind erosion that affect soil resources. Seedling development and wildlife habitat are negatively affected by wind-borne sediment and sediment-borne contaminants travelling offsite.

After Situation:

Implementation Requirements will be prepared for the site according to the 603 Herbaceous Wind Barrier Standard and implemented. Implementation of herbaceous wind barriers will modify the flow and velocity of air dependent upon barrier height, porosity, spacing and wind speed. Orientation is generally placed across an entire field perpendicular to applicable prevailing wind direction. Implementation will reduce soil loss; protect growing plants from damage by wind blown soil particles, provide food and cover for wildlife. Payment is for the design and implementation of annual barriers and required reestablishment.

Feature Measure: Linear Feet Planted

Scenario Unit: Feet

Scenario Typical Size: 1,000.0

Scenario Total Cost: $298.13

Scenario Cost/Unit: $0.30

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	1	$9.89
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	0.5	$10.16
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	2	$222.42
Materials						
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$111.33	0.5	$55.67

Practice: 606 - Subsurface Drain

Scenario: #1 - Corrugated Plastic Pipe (CPP), Single-Wall, <= 6 inch

Scenario Description:

Description: Below ground installation of perforated HDPE (Corrugated Plastic Pipe) pipeline, using a drainage plow. HDPE (CPP) Single-Wall is manufactured in sizes (nominal diameter) from 3-inch to 24-inch; typical practice sizes range from 3-inch to 12-inch; and typical scenario size is 5-inch. Construct 2,000 feet of 5-inch, Single-Wall, perforated HDPE Corrugated Plastic Pipe (CPP), installed below ground to a minimum depth 5 feet. The unit is in feet of pipe. The typical number of mainline connections for 2,000 feet of subsurface drainline is a total of 3 each. Resource Concerns: Excess Water (Seasonal High Water Table); Degraded Plant Condition; Water Quality Degradation (Nutrients). Associated Practices: 608 - Surface Drain, Main or Lateral; 587 - Structure for Water Control, 533 - Pumping Plant; and 554 - Drainage Water Management.

Before Situation:

Before installation soil conditions are excessively wet in the spring due to poor internal soil drainage. Excess soil water is causing crop stress and delay of field operations (seed bed preparation, planting, etc.).

After Situation:

The drainage modifications result in reduced plant stress due to excessive wetness caused by a seasonal high water table, or improved drainage water quality due to system retrofit enabling drainage water management.

Feature Measure: Feet of Pipe

Scenario Unit: Feet

Scenario Typical Size: 2,000.0

Scenario Total Cost: $7,124.53

Scenario Cost/Unit: $3.56

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Trenching, tile line plowing, earth, 60 in.	1457	Plowing in 3 -15 inch CPP drain line into earth, 60 inch depth, includes equipment and labor for trenching, laying, and backfilling.	Feet	$2.00	2000	$4,000.00
Materials						
Pipe, HDPE, 5 in., PCPT, Single Wall	1271	Pipe, Corrugated Plastic Tubing, Single Wall, Perforated, 5 inch diameter - ASTM F405. Material cost only.	Feet	$0.84	2000	$1,680.00
Drainage Lateral Connection	1458	Connect 3"-6" drainage lateral to main drain, includes excavation to 6' depth, install tee on main line, connect lateral, and backfill. Includes material cost for tee.	Each	$24.35	3	$73.05
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	2	$900.06

Practice: 606 - Subsurface Drain

Scenario: #2 - Enveloped Corrugated Plastic Pipe (CPP), Single-Wall, <= 6 inch

Scenario Description:

Description: Below ground installation of perforated HDPE (Corrugated Plastic Pipe) pipeline with Sand-Gravel envelope, using a drainage trencher. HDPE (CPP) Single-Wall is manufactured in sizes (nominal diameter) from 3-inch to 24-inch; typical practice sizes range from 3-inch to 12-inch; and typical scenario size is 5-inch. Construct 2,000 feet of 5-inch, Single-Wall, perforated HDPE Corrugated Plastic Pipe (CPP), installed below ground to a minimum depth of 5 feet, and surrounded with a sand-gravel envelope. The unit is in feet of pipe. The typical volume sand-gravel for 2,000 feet of 12"wide x 12" high envelope is 64 cubic yards. The typical number of mainline connections for 2,000 feet of subsurface drainline is a total of 3 each. Resource Concerns: Excess Water (seasonal High Water Table); Degraded Plant Condition; Water Quality Degradation (Nutrients). Associated Practices: 608 - Surface Drain, Main or Lateral; 587 - Structure for Water Control, 533 - Pumping Plant; and 554 - Drainage Water Management.

Before Situation:

Before installation soil conditions are excessively wet in the spring due to poor internal soil drainage. Excess soil water is causing crop stress and delay of field operations (seed bed preparation, planting, etc.).

After Situation:

The drainage modifications result in reduced plant stress due to excessive wetness caused by a seasonal high water table, or improved drainage water quality due to system retrofit enabling drainage water management.

Feature Measure: Weight of Pipe

Scenario Unit: Feet

Scenario Typical Size: 2,000.0

Scenario Total Cost: $9,267.17

Scenario Cost/Unit: $4.63

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Track Loader, 95HP	935	Equipment and power unit costs. Labor not included.	Hours	$83.63	8	$669.04
Trenching, Earth, 12 in. x 60 in.	1459	Trenching, earth, 12 inch wide x 60 inch depth, includes equipment and labor for trenching, laying 3 to 6 inch CPP drain line with envelope, and backfilling.	Feet	$1.64	2000	$3,280.00
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	8	$269.12
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	64	$1,924.48
Pipe, HDPE, 5 in., PCPT, Single Wall	1271	Pipe, Corrugated Plastic Tubing, Single Wall, Perforated, 5 inch diameter - ASTM F405. Material cost only.	Feet	$0.84	2000	$1,680.00
Drainage Lateral Connection	1458	Connect 3"-6" drainage lateral to main drain, includes excavation to 6' depth, install tee on main line, connect lateral, and backfill. Includes material cost for tee.	Each	$24.35	3	$73.05
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	2	$900.06

Practice: 606 - Subsurface Drain

Scenario: #3 - Corrugated Plastic Pipe (CPP), Single-Wall, >= 8 inch

Scenario Description:

Description: Below ground installation of HDPE (Corrugated Plastic Pipe) pipeline, using a drainage plow. HDPE (CPP) Single-Wall is manufactured in sizes (nominal diameter) from 3-inch to 24-inch; typical practice sizes range from 3-inch to 12-inch; and typical scenario size is 10-inch. Construct 1,000 feet of 10-inch, Single-Wall, HDPE Corrugated Plastic Pipe (CPP), installed below ground to a minimum depth 5 feet. The unit is in feet of pipe. Resource Concerns: Excess Water (Seasonal High Water Table); Degraded Plant Condition; Water Quality Degradation (Nutrients). Associated Practices: 607 - Surface Drain, Field Ditch; 608 - Surface Drain, Main or Lateral; 587 - Structure for Water Control, 533 - Pumping Plant; and 554 - Drainage Water Management.

Before Situation:

Before installation soil conditions are excessively wet in the spring due to poor internal soil drainage. Excess soil water is causing crop stress and delay of field operations (seed bed preparation, planting, etc.).

After Situation:

The drainage modifications result in reduced plant stress due to excessive wetness caused by a seasonal high water table, or improved drainage water quality due to system retrofit enabling drainage water management.

Feature Measure: Feet of Pipe

Scenario Unit: Feet

Scenario Typical Size: 1,000.0

Scenario Total Cost: $6,760.06

Scenario Cost/Unit: $6.76

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Trenching, tile line plowing, earth, 60 in.	1457	Plowing in 3 -15 inch CPP drain line into earth, 60 inch depth, includes equipment and labor for trenching, laying, and backfilling.	Feet	$2.00	1000	$2,000.00
Materials						
Pipe, HDPE, 10 in., PCPT, Single Wall	1273	Pipe, Corrugated Plastic Tubing, Single Wall, Perforated, 10 inch diameter - ASTM F667. Material cost only.	Feet	$3.86	1000	$3,860.00
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	2	$900.06

Practice: 606 - Subsurface Drain

Scenario: #4 - Corrugated Plastic Pipe (CPP), Twin-Wall, >= 8 inch

Scenario Description:

Description: Below ground installation of HDPE (Corrugated Plastic Pipe) pipeline, using a drainage plow. HDPE (CPP) Twin-Wall is manufactured in sizes (nominal diameter) from 4-inch to 60-inch; typical practice sizes range from 8-inch to 15-inch; and typical scenario size is 12-inch. Construct 1,000 feet of 12-inch, Twin-Wall, HDPE Corrugated Plastic Pipe (CPP), installed below ground to a minimum depth 5 feet. The unit is in weight of pipe material in pounds. 1,000 feet of 12-inch, Twin-Wall, HDPE CPP weighs 3.20 lb/ft, or a total of 3,200 pounds. Resource Concerns: Excess Water (Seasonal High Water Table); Degraded Plant Condition; Water Quality Degradation (Nutrients). Associated Practices: 607 - Surface Drain, Field Ditch; 608 - Surface Drain, Main or Lateral; 587 - Structure for Water Control, 533 - Pumping Plant; and 554 - Drainage Water Management.

Before Situation:

Before installation soil conditions are excessively wet in the spring due to poor internal soil drainage. Excess soil water is causing crop stress and delay of field operations (seed bed preparation, planting, etc.).

After Situation:

The drainage modifications result in reduced plant stress due to excessive wetness caused by a seasonal high water table, or improved drainage water quality due to system retrofit enabling drainage water management.

Feature Measure: Feet of Pipe

Scenario Unit: Feet

Scenario Typical Size: 1,000.0

Scenario Total Cost: $14,374.46

Scenario Cost/Unit: $14.37

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Trenching, Earth, 24 in. x 60 in.	1460	Trenching, earth, 24 inch wide x 60 inch depth, includes equipment and labor for trenching and backfilling.	Feet	$3.18	1000	$3,180.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	16	$387.04
Materials						
Pipe, HDPE, corrugated double wall, LTE-12 in., soil tight, weight priced	1587	High Density Polyethylene (HDPE) compound manufactured into double wall corrugated pipe LTE-12 inch diameter. Materials only.	Pound	$3.23	3200	$10,336.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 606 - Subsurface Drain

Scenario: #5 - Secondary Main Retrofit

Scenario Description:

An agricultural field has existing patterned tile system installed at 75 foot spacings. The field is 75 acres in size: 2475' x 1320', with a single main line at the low end of the field (2475'). The laterals are installed perpendicular to the topographic contours. The field has 3.5 feet of fall in the 1/4 mile length of the laterals, so a secondary main will be needed to allow drainage water management to be implemented on the higher half of the field.

Before Situation:

The patterned tile drainage system allows free flow of drainage water to a receiving ditch. Drainage water carries nitrogen and phosphorus out of the soil and these nutrients pollute the receiving waters.

After Situation:

A 12 inch diameter secondary mainline is retrofitted to the drainage system, located halfway up the field and relatively parallel to the topographic contours. This new mainline is hooked to each individual lateral and continued to a stable outlet. A Drainage Water practice must be completed along with the mainline; typically Structures for Water Control (587) installed at two foot vertical intervals so that water can be retained in the field. This scenario also applies to systems where the secondary main is used to connect drain lines that formerly each exited separately to the ditch, with a structure that distributes the drainage water into the subsurface soil at a vegetated buffer (772) OR a Denitrifying Bioreactor (747) might be installed at the outlet. In combination or singly, one of these practices must be installed with the secondary main.

Feature Measure: Feet of Pipe

Scenario Unit: Feet

Scenario Typical Size: 3,135.0

Scenario Total Cost: $23,393.68

Scenario Cost/Unit: $7.46

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Trenching, tile line plowing, earth, 60 in.	1457	Plowing in 3 -15 inch CPP drain line into earth, 60 inch depth, includes equipment and labor for trenching, laying, and backfilling.	Feet	$2.00	3135	$6,270.00
Materials						
Pipe, HDPE, 12 in., PCPT, Single Wall	1274	Pipe, Corrugated Plastic Tubing, Single Wall, Perforated, 12 inch diameter - ASTM F667. Material cost only.	Feet	$5.07	3135	$15,894.45
Drainage Lateral Connection	1458	Connect 3"-6" drainage lateral to main drain, includes excavation to 6' depth, install tee on main line, connect lateral, and backfill. Includes material cost for tee.	Each	$24.35	32	$779.20
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	1	$450.03

Practice: 606 - Subsurface Drain

Scenario: #12 - Large Interceptor Drain

Scenario Description:

Description: Below ground installation of an interceptor drain constructed from perforated HDPE (Corrugated Plastic Pipe) pipeline within graded gravel envelope, using a hydraulic excavator. HDPE (CPP) Single-Wall is manufactured in sizes (nominal diameter) from 3-inch to 24-inch; typical practice sizes range from 3-inch to 12-inch; and typical scenario size is 8-inch. Construct 2,000 feet of 8-inch, Single-Wall, perforated HDPE Corrugated Plastic Pipe (CPP), installed below ground to a minimum depth of 6 feet, and surrounded with a graded gravel filter envelope. The unit is in length of drain installed. 2,000 feet of 8-inch, Single-Wall, perforated HDPE CPP weighs 1.23 lb./ft., or a total of 2,460 pounds. The typical volume sand-gravel for 2,000 feet of 24"wide x 24" high envelope is 296 cubic yards. The interceptor drain outlets to an open ditch. One section (20ft) of CMP or heavy duty PVC is used as a sleeve to protect the outlet end of the drain, and an animal guard is installed. Resource Concerns: Excess Water (seasonal High Water Table); Degraded Plant Condition; Water Quality Degradation (Nutrients and salts); Soil Quality (salinity). Associated Practices: 587 - Structure for Water Control, 533 - Pumping Plant; and 554 - Drainage Water Management.

Before Situation:

Before installation soil conditions are excessively wet and saline due to shallow seepage from adjacent canals, irrigation return flows or a natural spring. Excess soil water is causing increased soil salinity, crop stress or loss, and delay of field operations or access for other uses.

After Situation:

The drainage modifications result in reduced accumulation of salts, reduced plant stress, and more timely access.

Feature Measure: Feet of Drain Installed

Scenario Unit: Linear Feet

Scenario Typical Size: 2,000.0

Scenario Total Cost: $43,344.67

Scenario Cost/Unit: $21.67

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$100.83	24	$2,419.92
Track Loader, 95HP	935	Equipment and power unit costs. Labor not included.	Hours	$83.63	24	$2,007.12
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	64	$1,548.16
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	96	$3,229.44
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	593	$17,831.51
Pipe, PVC, 12 in., SDR 35	1252	Pipe, PVC, SDR 35, 12 inch Diameter - ASTM D3034. Material cost only.	Feet	$21.37	190	$4,060.30
Pipe, HDPE, 8 in,, PCPT, Single Wall	1272	Pipe, Corrugated Plastic Tubing, Single Wall, Perforated, 8 inch diameter - ASTM F667. Material cost only.	Feet	$2.15	2460	$5,289.00
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	4	$1,800.12
Aggregate, Shipping, Cubic Yard-mile	2360	Mobilization of aggregate material beyond 20 miles of local delivery from quarry to construction site. Cubic Yard-mile (Cubic Yard * miles of haul).	Cubic Yard Mile	$0.29	17790	$5,159.10

Practice: 607 - Surface Drain, Field Ditch

Scenario: #1 - Field Drainage Ditch

Scenario Description:

This scenario is the construction of a surface drain, field ditch. Typical construction dimensions are 4' bottom x 2.5' deep x 1320' length with a side slope of 3:1. Excess water is either reused in an Irrigation System, Tailwater Recovery (447) system, or conveyed to a receiving water body. Resource concerns: Excess/Insufficient Water - Inefficient Use of Irrigation Water and Water Quality Degradation - Excessive Sediment in Surface Waters. Associated Conservation Practices: 608-Surface Drain, Main or Lateral; 587 -Structure For Water Control; 554 - Drainage Water Management

Before Situation:

Excess water has no outlet and backs up into the fields causing damage or loss of the crop.

After Situation:

An earthen ditch that follows the natural slope of the land at the low end of the field will be constructed to carry excess water to an outlet.

Feature Measure: Volume of Earth Excavated

Scenario Unit: Cubic Yards

Scenario Typical Size: 1,406.0

Scenario Total Cost: $3,241.54

Scenario Cost/Unit: $2.31

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	1406	$2,924.48
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	2	$317.06

Practice: 608 - Surface Drain, Main or Lateral

Scenario: #1 - Main or Lateral Drainage Ditch

Scenario Description:

This scenario is the construction of a surface drain, main or lateral. Typical construction dimensions are 4' wide bottom x 4' deep x 1320' length with a side slope of 2.5:1. Resource Concerns: Excess/Insufficient Water - Inefficient Use of Irrigation Water and Water Quality Degradation - Excessive Sediment in Surface Waters. Associated Conservation Practices: 607-Surface Drain, Field Ditch; 587 -Structure For Water Control; 554 Drainage Water Management

Before Situation:

Excess water has no outlet and backs up into the fields causing damage or loss of the crop.

After Situation:

An earthen ditch that follows the natural slope of the land at the low end of the field is constructed to carry excess water to an outlet so that water no longer backs up into the field so that field production is improved.

Feature Measure: Volume of Earth Excavated

Scenario Unit: Cubic Yards

Scenario Typical Size: 2,738.0

Scenario Total Cost: $5,853.57

Scenario Cost/Unit: $2.14

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	2738	$5,695.04
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53

Practice: 610 - Salinity and Sodic Soil Management

Scenario: #1 - Soil Management (non-Irrigated)

Scenario Description:

The producer secures training in Salinity and Sodic Soil Management, analyzes subsurface conditions in areas in and around a saline seep and using information gained from training and field observations carrys out a Salinity and Sodic Soil Management Plan employing as applicable changes in Conservation Cropping Systems, Critical Area Planting, Nutrient Management and use of soil amendments. Scenario includes cost of attending a 6 hr University, NRCS, or commodity group sponsored training session and 40 hours of mgt labor a year to analyze available data and field situation, then review, and modify as necessary the Salinity and Sodic Soil Management Plan and continue to carry it out. Resource Concerns: Soil Quality Degradation - Concentration of salts or other chemicals, and Water Quality Degradation- Excessive salts in surface and ground waters. Associated Practices: 328 -Conservation Cropping System; 342- Critical Area Planting; and 590 - Nutrient Management.

Before Situation:

A crop-fallow system on sodic and saline soils has resulted in saline seeps. The recharge area of the seep must be determined before the extents of the treatment can be planned. An analyses of the subsurface conditions in areas in and around a saline is completed on 95 acres of recharge area surrounding a 5 acre saline seep in order to determine groundwater gradients and limits of the recharge area.

After Situation:

A determination of extent of recharge area has been made. The area to be treated has been identified. The producer has developed and is carrying out a Salinity and Sodic Soil Management Plan. Deep percolation in the recharge area is eliminated and salts no longer leach into the ground or surface water.

Feature Measure: Acres included in Salinity and Sodic

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $1,922.85

Scenario Cost/Unit: $19.23

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$109.25	1	$109.25
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	40	$1,813.60

Practice: 610 - Salinity and Sodic Soil Management

Scenario: #2 - Soil Management (Irrigated)

Scenario Description:

The producer secures training in Salinity and Sodic Soil Management and develops and carries out a Salinity and Sodic Soil Management Plan. Scenario includes cost of attending a 6 hr University, NRCS, or commodity group sponsored training session and 12 hours of mgt labor a year to analyze available data and field situation, develop (or review and modify as necessary) plan and carry it out. Resource Concerns: Soil Quality Degradation - Concentration of salts or other chemicals, Water Quality Degradation- Excessive salts in surface and ground waters, and plant productivity. Associated Practices: 328-Conservation Crop Rotation; 449-Irrigation Water Management; and 590-Nutrient Management.

Before Situation:

Salintiy and or Sodic conditions have developed in the root zone of a 100 acre irrigated cropland field resulting in decreased soil quality, plant health problems, and yield reductions.

After Situation:

Producer conducts soil and irrigation water analysis to determine the irrigation leaching requirement needed based on crop consumptive use and salinity levels of the irrigation water to flush accumulated salts and maintain a proper salt balance. Routine periodic checks of water EC will be conducted by producer to monitor for water salinity which might require changes to Salinity and Sodic Soil Management Plan. The Salinity and Sodic Soil Management Plan is carried out employing soil and water testing and as applicable changes in Irrigation Water Management (449), Conservation Crop Rotation (328), tillage, and use of soil and or water amendments. The producer has developed and is carrying out a Salinity and Sodic Soil Management Plan resulting in improved soil quality and plant health.

Feature Measure: Acres included in Salinity and Sodic

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $2,063.73

Scenario Cost/Unit: $20.64

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$109.25	1	$109.25
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	40	$1,813.60
Materials						
Test, Soil Test, Precision, Grid or Zone DELETION SCHEDULED for PS FY 2018 , USE CID 299	300	Includes materials, shipping, labor, and equipment costs. DELETION SCHEDULED for PS FY 2018 , USE CID 299	Each	$7.56	12	$90.72
Test, Standard Water Test, Irrigation Suitability	310	Irrigation water suitability lab analysis. Includes pH, alkalinity, carbonates/bicarbonates, EC, dissolved solids, B, Cl, Ca, Mg, Na, SAR, and hardness.	Each	$50.16	1	$50.16

Practice: 610 - Salinity and Sodic Soil Management

Scenario: #3 - Soil Management (Irrigated Gypsum)

Scenario Description:

The producer secures training in Salinity and Sodic Soil Management and develops and carries out a Salinity and Sodic Soil Management Plan that involves the application of gypsum to address a sodicity soil problem. Scenario includes cost of attending a 6 hr University, NRCS, or commodity group sponsored training session and 12 hours of mgt labor a year to analyze available data and field situation, develop (or review and modify as necessary) plan and carry it out. Resource Concerns: Soil Quality Degradation - Concentration of salts or other chemicals, Water Quality Degradation- Excessive salts in surface and ground waters, and plant productivity. Associated Practices: 328-Conservation Crop Rotation; 449-Irrigation Water Management; and 590-Nutrient Management.

Before Situation:

Preliminary field assessment has indicated a Sodic soil condition has developed in the root zone of a 100 acre irrigated cropland field and that a gypsum application will be needed to increase soil quality, reduce plant health problems, and eliminate yield impacts.

After Situation:

Producer conducts soil and irrigation water analysis to determine the amount of gypsum to apply and irrigation leaching requirement needed based on crop consumptive use and sodium (SAR or ESP) concentrations of the soil. Producer conducts routine soil and water analysis to determine any required changes to Salinity and Sodic Soil Management Plan. The Salinity and Sodic Soil Management Plan is carried out employing soil and water testing and as applicable changes in Irrigation Water Management (449), Conservation Crop Rotation (328), tillage, and use of soil and or water amendments. The producer has developed and is carrying out a Salinity and Sodic Soil Management Plan resulting in improved soil quality and plant health.

Feature Measure: Acres included in Salinity and Sodic

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $13,700.73

Scenario Cost/Unit: $137.01

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$109.25	1	$109.25
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	40	$1,813.60
Materials						
Test, Soil Test, Precision, Grid or Zone DELETION SCHEDULED for PS FY 2018 , USE CID 299	300	Includes materials, shipping, labor, and equipment costs. DELETION SCHEDULED for PS FY 2018 , USE CID 299	Each	$7.56	12	$90.72
Test, Standard Water Test, Irrigation Suitability	310	Irrigation water suitability lab analysis. Includes pH, alkalinity, carbonates/bicarbonates, EC, dissolved solids, B, Cl, Ca, Mg, Na, SAR, and hardness.	Each	$50.16	1	$50.16
Gypsum, Ground Ag Grade, Bulk	1224	Agricultural grade quarry ground gypsum ($CaCO_4$) for dispersive soil treatment. Materials and delivery only.	Ton	$38.79	300	$11,637.00

Practice: 610 - Salinity and Sodic Soil Management

Scenario: #4 - Small Farm<10acres (Irrigated)

Scenario Description:

This scenario is for small irrigated farms typically 10 acres or less in size. The producer secures training in Salinity and Sodic Soil Management and develops and carries out a Salinity and Sodic Soil Management Plan. Scenario includes cost of attending a 6 hr University, NRCS, or commodity group sponsored training session and 12 hours of mgt labor a year to analyze available data and field situation, develop (or review and modify as necessary) plan and carry it out. Resource Concerns: Soil Quality Degradation - Concentration of salts or other chemicals, Water Quality Degradation- Excessive salts in surface and ground waters, and plant productivity. Associated Practices: 328-Conservation Crop Rotation; 449-Irrigation Water Management; and 590-Nutrient Management.

Before Situation:

Salintiy and or Sodic conditions have developed in the root zone of a Small Farm (10 acre) with irrigated cropland resulting in decreased soil quality, plant health problems, and yield reductions.

After Situation:

Producer conducts soil and irrigation water analysis to determine the irrigation leaching requirement needed based on crop consumptive use and salinity levels of the irrigation water to flush accumulated salts and maintain a proper salt balance. Routine periodic checks of water EC will be conducted by producer to monitor for water salinity which might require changes to Salinity and Sodic Soil Management Plan. The Salinity and Sodic Soil Management Plan is carried out employing soil and water testing and as applicable changes in Irrigation Water Management (449), Conservation Crop Rotation (328), tillage, and use of soil and or water amendments. The producer has developed and is carrying out a Salinity and Sodic Soil Management Plan resulting in improved soil quality and plant health.

Feature Measure: Acres included in Salinity and Sodic

Scenario Unit: Acres

Scenario Typical Size: 10.0

Scenario Total Cost: $1,988.13

Scenario Cost/Unit: $198.81

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$109.25	1	$109.25
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	40	$1,813.60
Materials						
Test, Soil Test, Precision, Grid or Zone DELETION SCHEDULED for PS FY 2018 , USE CID 299	300	Includes materials, shipping, labor, and equipment costs. DELETION SCHEDULED for PS FY 2018 , USE CID 299	Each	$7.56	2	$15.12
Test, Standard Water Test, Irrigation Suitability	310	Irrigation water suitability lab analysis. Includes pH, alkalinity, carbonates/bicarbonates, EC, dissolved solids, B, Cl, Ca, Mg, Na, SAR, and hardness.	Each	$50.16	1	$50.16

Practice: 612 - Tree/Shrub Establishment

Scenario: #1 - Individual tree, large - hand planting

Scenario Description:

Larger sized seedlings will be hand planted in the forested area where few or no forest trees or shrubs are growing, the existing stand of trees or shrubs needs underplanting, or the previously planted seedling tree or shrub stocking level is below desirable conditions. Wildlife habitat is degraded by loss of forest conditions. This resource concern addressed is degraded plant condition -- and inadequate structure and composition, and inadequate wildlife & fish habitat.

Before Situation:

The stocking level of the forest does not meet the minimum recommended number of trees per acre. The existing condition of the forest stand does not meet the landowners objectives. To be a viable forest additional seedlings need planting. Wildlife habitat is rated poor.

After Situation:

The prescribed number of trees are hand planted on 20 acres, and the objectives of the landowner are met. The forest will provide wildlife habitat, provide a long term ground cover, and capture atmospheric carbon.

Feature Measure: Area Planted

Scenario Unit: Each

Scenario Typical Size: 2,000.0

Scenario Total Cost: $29,456.72

Scenario Cost/Unit: $14.73

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	8	$178.32
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$11.47	30	$344.10
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	40	$967.60
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	5	$226.70
Materials						
Shrub, Potted, Medium	1527	Potted shrub seedling, 2 gallons or larger. Includes materials and shipping only.	Each	$13.67	2000	$27,340.00
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	400	$400.00

Practice: 612 - Tree/Shrub Establishment

Scenario: #2 - Individual tree, medium - hand planting

Scenario Description:

Medium sized seedlings will be hand planted in the forested area where few or no forest trees or shrubs are growing, the existing stand of trees or shrubs needs underplanting, or the previously planted seedling tree or shrub stocking level is below desirable conditions. Wildlife habitat is degraded by loss of forest conditions. This resource concern addressed is degraded plant condition -- and inadequate structure and composition, and inadequate wildlife & fish habitat.

Before Situation:

The stocking level of the forest does not meet the minimum recommended number of trees per acre. The existing condition of the forest stand does not meet the landowners objectives. To be a viable forest additional seedlings need planting. Wildlife habitat is rated poor.

After Situation:

The prescribed number of trees are hand planted on 20 acres, and the objectives of the landowner are met. The forest will provide wildlife habitat, provide a long term ground cover, and capture atmospheric carbon.

Feature Measure: Area Planted

Scenario Unit: Each

Scenario Typical Size: 2,000.0

Scenario Total Cost: $14,570.43

Scenario Cost/Unit: $7.29

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	8	$178.32
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$11.47	30	$344.10
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	35	$846.65
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	4	$181.36
Materials						
Shrub, Potted, Small	1524	Potted shrub seedling, 1 quart to 1 gallon. Includes materials and shipping only.	Each	$6.41	2000	$12,820.00
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	200	$200.00

Practice: 612 - Tree/Shrub Establishment

Scenario: #3 - Individual tree, small - hand planting

Scenario Description:

Small seedlings will be hand planted in the forested area where few or no forest trees or shrubs are growing, the existing stand of trees or shrubs needs underplanting, or the previously planted seedling tree or shrub stocking level is below desirable conditions. Wildlife habitat is degraded by loss of forest conditions. This resource concern addressed is degraded plant condition -- and inadequate structure and composition, and inadequate wildlife & fish habitat.

Before Situation:

The stocking level of the forest does not meet the minimum recommended number of trees per acre. The existing condition of the forest stand does not meet the landowners objectives. To be a viable forest additional seedlings need planting. Wildlife habitat is rated poor.

After Situation:

The prescribed number of trees are hand planted on 20 acres, and the objectives of the landowner are met. The forest will provide wildlife habitat, provide a long term ground cover, and capture atmospheric carbon.

Feature Measure: Area Planted

Scenario Unit: Each

Scenario Typical Size: 2,000.0

Scenario Total Cost: $3,203.60

Scenario Cost/Unit: $1.60

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	8	$178.32
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$11.47	26	$298.22
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	30	$725.70
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	4	$181.36
Materials						
Tree, Conifer, Seedling, Medium	1514	Containerized conifer seedlings, 8 or 10 cubic inches; or bare root conifer seedlings 1+1 (two-year old seedlings that grew one year in the original seedbed and another year in a transplant bed), or bare root seedlings 2+0 (two-year old seedlings grown in their original seedbed). Includes materials and shipping only.	Each	$0.86	2000	$1,720.00
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	100	$100.00

Practice: 612 - Tree/Shrub Establishment

Scenario: #4 - Individual tree - hand planting w/browse protection

Scenario Description:

Tree seedlings will be hand planted in the forested area where few or no forest trees growing, the existing stand of trees needs underplanting, or the previously planted seedling tree stocking level is below desirable conditions. Seedlings are protected from wildlife browsing. Wildlife habitat is degraded by loss of forest conditions. This resource concern addressed is degraded plant condition -- and inadequate structure and composition, and inadequate wildlife & fish habitat.

Before Situation:

The stocking level does not meet the minimum recommended number of trees per acre and does not meet the landowners objectives. To be a viable forest additional seedlings need planting. Wildlife habitat is rated poor. Wildlife are known to browse tree seedlings in the area causing great damage.

After Situation:

The prescribed number of trees are hand planted on 20 acres and the objectives of the landowner are met. Seedlings are protected from widlife browsing by installing some type of protection devise. A forest will provide wildlife habitat, provide a long term ground and capture atmospheric carbon.

Feature Measure: Each Planted Seedling

Scenario Unit: Each

Scenario Typical Size: 2,000.0

Scenario Total Cost: $6,945.04

Scenario Cost/Unit: $3.47

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	4	$89.16
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$11.47	28	$321.16
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	112	$2,709.28
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	16	$725.44
Materials						
Tree, Conifer, Seedling, Medium	1514	Containerized conifer seedlings, 8 or 10 cubic inches; or bare root conifer seedlings 1+1 (two-year old seedlings that grew one year in the original seedbed and another year in a transplant bed), or bare root seedlings 2+0 (two-year old seedlings grown in their original seedbed). Includes materials and shipping only.	Each	$0.86	2000	$1,720.00
Tree shelter, mesh tree tube, 24 in.	1555	24 inch tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only.	Each	$0.40	2000	$800.00
Stake, bamboo, 3/8 in. x 36 in.	1584	3/8 in. x 36 in. bamboo stakes to anchor items in place. Inlcudes materials and shipping only.	Each	$0.12	4000	$480.00
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	100	$100.00

Practice: 612 - Tree/Shrub Establishment

Scenario: #5 - Medium Density-hand plant Conifer, protect from widlife

Scenario Description:

This practice involves planting of tree seedlings after the site has been prepared for seedling growth and establishment. The productivity of the site is good and will handle a medium density planting rate. Newly planted conifer seedlings are protected from browsing by installing open tree tubes. Resource concerns addressed are degraded plant condition -- undesirable plant productivity and health, and inadequate structure and composition and degraded wildlife habitat. Terrain is moderatey to steeply sloping, too steep to be planted with a mechanical tree planter so the area is hand planted.

Before Situation:

The land has a little/no tree cover, or is stocked with the wrong tree species. Competing vegetation is a before and after planting concern. Soil condition is degraded due to the lose of the native forest ecosystem (organic matter in top soil depleted). The main resource concern is degraded plant condition and inadequate structure and composition

After Situation:

40 acres of land is established with permanent tree coverthat will improve degraded plant condition, reduce soil erosion, establish wildlife habitat, sequester carbon and reduce invasive species presence. Establishing forest vegetation also creates corridors for wildlife movement. Half of planted trees have vexar tubes, or similar, installed to protect from animal damage.

Feature Measure: Area of Treatment

Scenario Unit: Acres

Scenario Typical Size: 40.0

Scenario Total Cost: $18,641.08

Scenario Cost/Unit: $466.03

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	20	$445.80
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$11.47	120	$1,376.40
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	200	$4,838.00
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	32	$1,450.88
Materials						
Tree, Conifer, Seedling, Small	1512	Containerized conifer seedlings, 4 or 6 cubic inches; or bare root conifer seedlings 1+0 (one-year old seedlings grown in their original seedbed). Includes materials and shipping only.	Each	$0.51	9000	$4,590.00
Tree shelter, mesh tree tube, 24 in.	1555	24 inch tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only.	Each	$0.40	9000	$3,600.00
Stakes, bamboo 3/8 in. x 48 in.	1585	3/8 in. x 48 in. bamboo stakes to anchor items in place. Inlcudes materials and shipping only.	Each	$0.26	9000	$2,340.00

Practice: 612 - Tree/Shrub Establishment

Scenario: #6 - Medium Density-hand plant Conifer

Scenario Description:

This practice involves planting of tree seedlings after the site has been prepared for seedling growth and establishment. The productivity of the site is good and will handle a medium density planting rate. Resource concerns addressed are degraded plant condition -- undesirable plant productivity and health, and inadequate structure and composition and degraded wildlife habitat. Terrain is moderatey to steeply sloping, too steep to be planted with a mechanical tree planter so the area is hand planted.

Before Situation:

The land has a little/no tree cover, or is stocked with the wrong tree species. Competing vegetation is a before and after planting concern. Soil condition is degraded due to the lose of the native forest ecosystem (organic matter in top soil depleted). The main resource concerns are degraded plant condition and inadequate structure and composition

After Situation:

40 acres of land is established with permanent tree cover that will improve degraded plant condition, reduce soil erosion, establish wildlife habitat, sequester carbon and reduce invasive species presence. Establishing forest vegetation also creates corridors for wildlife movement.

Feature Measure: Area of Treatment

Scenario Unit: Acres

Scenario Typical Size: 40.0

Scenario Total Cost: $10,040.44

Scenario Cost/Unit: $251.01

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	20	$445.80
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$11.47	120	$1,376.40
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	120	$2,902.80
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	16	$725.44
Materials						
Tree, Conifer, Seedling, Small	1512	Containerized conifer seedlings, 4 or 6 cubic inches; or bare root conifer seedlings 1+0 (one-year old seedlings grown in their original seedbed). Includes materials and shipping only.	Each	$0.51	9000	$4,590.00

Practice: 612 - Tree/Shrub Establishment

Scenario: #7 - Medium Density-Conifer

Scenario Description:

This practice involves planting of tree seedlings after the site has been prepared for seedling growth and establishment. The productivity of the site is good and will handle a medium density planting rate. The resource concerns addressed is degraded plant condition -- undesirable plant productivity and health, and inadequate structure and composition and degraded wildlife habitat. Terrain is moderatey sloping and will be planted with a mechanical tree planter. Smaller size seedlings (1-0) are planted.

Before Situation:

The land has a little or no tree cover, or is stocked with the wrong tree species. Competing vegetation is a before and after planting concern. Soil condition is degraded due to the lose of the native forest ecosystem (organic matter in top soil depleted). Native wildlife habitat is lacking. The main resource concern is degraded plant condition and inadequate structure and composition

After Situation:

40 acres of land is established with permanent tree coverthat will improve degraded plant condition, reduce soil erosion, establish wildlife habitat, sequester carbon and reduce invasive species presence. Establishing forest vegetation also creates corridors for wildlife movement. Half of planted trees have vexar tubes, or similar, installed to protect from animal damage.

Feature Measure: Area of Treatment

Scenario Unit: Acres

Scenario Typical Size: 40.0

Scenario Total Cost: $12,005.17

Scenario Cost/Unit: $300.13

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.89	18	$916.02
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	8	$178.32
Mechanical tree planter	1600	Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor.	Hours	$5.49	18	$98.82
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	24	$580.56
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	20	$529.20
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	8	$362.72
Materials						
Tree, Conifer, Seedling, Small	1512	Containerized conifer seedlings, 4 or 6 cubic inches; or bare root conifer seedlings 1+0 (one-year old seedlings grown in their original seedbed). Includes materials and shipping only.	Each	$0.51	18000	$9,180.00
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	1	$1.00
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53

Practice: 612 - Tree/Shrub Establishment

Scenario: #8 - High Density planting

Scenario Description:

This practice applies to forestlands that are being actively managed. Tree seedlings are planted after the site has been prepared for seedling establishment and growth. Forest site productivity is high or very high and dense planting is planned. Larger containerized seedlings are planted. Resource concerns addressed are degraded plant condition -- undesirable plant productivity and health, and inadequate structure and composition and degraded wildlife habitat. Terrain conditions allow for mechanical tree planting

Before Situation:

The land lacks forest cover and needs replanting, is stocked with the wrong tree species, or is a nonstocked field. Seedlings selected are appropriate for the site and site conidtions. The main resource concerns are degraded plant condition and inadequate structure and composition. Competing vegetation is a before and after planting concern. Soil condition is degraded due to the loss organic matter in top soil. Tree seedlings with larger size root systems are planted to compete with other vegetation.

After Situation:

50 acres of land is established with permanent tree cover that will improve degraded plant condition, establish wildlife habitat, sequester atmospheric carbon. Establishing forest vegetation also creates corridors for wildlife movement. Actions should be planned with competing vegetation concerns.

Feature Measure: area of treatment

Scenario Unit: Acres

Scenario Typical Size: 50.0

Scenario Total Cost: $34,544.60

Scenario Cost/Unit: $690.89

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.89	34	$1,730.26
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	14	$312.06
Mechanical tree planter	1600	Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor.	Hours	$5.49	34	$186.66
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	40	$967.60
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	37	$979.02
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	14	$634.76
Materials						
Tree, Conifer, Seedling, Medium	1514	Containerized conifer seedlings, 8 or 10 cubic inches; or bare root conifer seedlings 1+1 (two-year old seedlings that grew one year in the original seedbed and another year in a transplant bed), or bare root seedlings 2+0 (two-year old seedlings grown in their original seedbed). Includes materials and shipping only.	Each	$0.86	34000	$29,240.00
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	100	$100.00
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 612 - Tree/Shrub Establishment

Scenario: #9 - Hardwood Hand Planting-bare root-protected

Scenario Description:

Improving the hardwood forest setting by hand planting hardwood tree seedlings. Seedlings are protected from deer browsing. The number of trees to plant is lower than establishing a new forest. Resource concerns are degraded plant condition - undesireable productivity and health, and Inadequate structure and composition; inadequate habitat for fish and wildlife - habitat degradation.

Before Situation:

In an existing upland forest the present trees are poor quality, at low stocking levels, or are undesirable species. Existing conditions do not meet landonwer objectives of growing high quality trees. Wildlife habitat is poor due to the above described conditions. Resource concerns are degrade plant condition - undesireable productivity and health, and Inadequate structure and composition; inadequate habitat for fish and wildlife - habitat degradation. Prior to planting any needed vegetation control will be conducted first.

After Situation:

The area of treatment is 10 acres. Bare root hardwood seedlings are planted by hand in the best locations for seedling survival. Solid tree tubes are installed to protect seedlings from animal browsing damage. Post planting vegetation control is planned to ensure seedling survival.

Feature Measure: Area of Treatment

Scenario Unit: Acres

Scenario Typical Size: 10.0

Scenario Total Cost: $7,038.32

Scenario Cost/Unit: $703.83

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	8	$178.32
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$11.47	12	$137.64
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	56	$1,354.64
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	8	$362.72
Materials						
Tree, Hardwood, Seedling, Small	1509	Bare root hardwood seedlings 6 to 18 inches tall; includes tropical containerized seedlings of 8 cubic inches or smaller. Includes materials and shipping only.	Each	$0.78	1500	$1,170.00
Tree shelter, solid tube type, 3-1/4 in. x 30 in.	1560	3-1/4 inch x 30 inch tree tube for protection from animal damage. Materials only.	Each	$1.72	1500	$2,580.00
Stakes, wood, 3/4 in. x 3/4 in. x 36 in.	1581	3/4 in. x 3/4 in. x 36 in. wood stakes to fasten items in place. Includes materials only.	Each	$0.77	1500	$1,155.00
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	100	$100.00
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	0	$0.00

Practice: 612 - Tree/Shrub Establishment

Scenario: #10 - Hardwood Planting 1 gal pots

Scenario Description:

Hardwood seedlings (potted) to be planted to restablish an upland hardwood forest. Planting will be by hand. The resource setting is an area that historically was an upland hardwood forest. Resource concerns are degrade plant condition - undesireable productivity and health, and Inadequate structure and composition; inadequate habitat for fish and wildlife.

Before Situation:

The native forest that has been removed and the land is either row cropped, grazed or hayed or brushy forest. If any upland trees exist they are poor quality tree or undesirable species. Terrain is gently to moderately sloping with soil erosion-sheet and rill ocurring.

After Situation:

The area of treatment is 10 acres. Potted/containerized hardwood seedlings are planted by hand. Post vegetation control should be evaluated and conducted it necessary.

Feature Measure: Area of Treatment

Scenario Unit: Acres

Scenario Typical Size: 10.0

Scenario Total Cost: $13,501.79

Scenario Cost/Unit: $1,350.18

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	8	$178.32
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$11.47	30	$344.10
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	35	$846.65
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	8	$362.72
Materials						
Tree, Hardwood, Potted, Small	1529	Potted hardwood seedling, 1 quart to 1 gallon. Includes materials and shipping only.	Each	$7.78	1500	$11,670.00
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	100	$100.00
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	0	$0.00

Practice: 612 - Tree/Shrub Establishment

Scenario: #12 - Shrub Planting

Scenario Description:

Shrubs are planted to provide a more diverse habitat. Plantings are in either uplands or bottomlands. The site lacks ground level habitat structure and diversity for widlife. Resource concern is inadequate habitat for fish and wildife - habitat fragmentation.

Before Situation:

No shrubbery vegetation, or very little, is present under the forest overstory. Wildlife species that need shrub cover are not present. An adequate stand of overstory trees is present, but it is a single level, not multi-level.

After Situation:

A 10 acre area is planted with shrubs. Shrubs are not planted over the entire 10 acres. They are planted in groups or motts. The motts, more or less circular in shape, are 50 feet in diameter, with 50 shrubs planted within each mott. 4 motts are planted per acre for a total of 200 shrubs per acre. Motts are randomly established to take advantage of site conditions and shrub species being planted.

Feature Measure: Area of Treatment

Scenario Unit: Acres

Scenario Typical Size: 10.0

Scenario Total Cost: $2,453.25

Scenario Cost/Unit: $245.33

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	6	$133.74
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$11.47	15	$172.05
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	18	$435.42
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	6	$272.04
Materials						
Shrub, Seedling, Small	1506	Bare root shrub seedling, 6 to 18 inches tall, includes tropical containerized seedlings less than 10 cubic inches. Includes materials and shipping only.	Each	$0.67	2000	$1,340.00
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	100	$100.00
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	0	$0.00

Practice: 614 - Watering Facility

Scenario: #1 - Permanent Drinking/Storage <500 Gallons

Scenario Description:

A permanent watering facility for livestockor wildlife constructed of approved materials with less than 500 gallons of capacity,to provide adequate quantity and quality of water for storage and or direct drinking access.

Before Situation:

This practice applies to all land uses where there is a need for new or improved watering facilities for livestock and or wildlife, where water is not available in sufficient quantities at specific locations, and habitat, water quality, plant productivity and health needs to be improved. Associated practices include: 516-Pipeline, 642-Water Well

After Situation:

A permanent watering facility is installed to ensure an adequate supply and quality of water for livestock or wildlife for storage and or direct drinking access. All watering facilities are constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation and placed on a properly prepared foundation with required plumbing.

Feature Measure: Capacity in Gallons

Scenario Unit: Gallons

Scenario Typical Size: 250.0

Scenario Total Cost: $830.98

Scenario Cost/Unit: $3.32

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	0.5	$1.04
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$29.47	2	$58.94
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	2	$44.58
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	2	$48.38
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	2	$52.92
Materials						
Wildlife Escape Ramp	242	Pool size 15' x 30', for small mammals less than one pound	Each	$63.01	1	$63.01
Tank, Galvanized Steel Livestock, >75 - 300 gallon	1067	Includes tank materials and float valve	Gallons	$1.26	250	$315.00
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic Yards	$22.79	0.5	$11.40
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 614 - Watering Facility

Scenario: #2 - Permanent Drinking/Storage > 500-1000 Gallons

Scenario Description:

A permanent watering facility for livestockor wildlife constructed of approved materials with 500-1000 gallons of capacity,to provide adequate quantity and quality of water for storage and or direct drinking access.

Before Situation:

This practice applies to all land uses where there is a need for new or improved watering facilities for livestock and or wildlife, where water is not available in sufficient quantities at specific locations, and habitat, water quality, plant productivity and health needs to be improved. Associated practices include: 516-Pipeline, 642-Water Well

After Situation:

A permanent watering facility is installed to ensure an adequate supply and quality of water for livestock or wildlife for storage and or direct drinking access. All watering facilities are constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation and placed on a properly prepared foundation with required plumbing.

Feature Measure: Capacity in Gallons

Scenario Unit: Gallons

Scenario Typical Size: 750.0

Scenario Total Cost: $1,802.73

Scenario Cost/Unit: $2.40

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	2	$4.16
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$29.47	6	$176.82
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	6	$133.74
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	6	$204.72
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	6	$145.14
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	6	$158.76
Materials						
Wildlife Escape Ramp	242	Pool size 15' x 30', for small mammals less than one pound	Each	$63.01	1	$63.01
Tank, Galvanized Steel Livestock, > 300 - 1,000 gallon	1068	Includes tank materials and float valve	Gallons	$0.76	750	$570.00
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic Yards	$22.79	2	$45.58
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	1	$65.09
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 614 - Watering Facility

Scenario: #3 - Permanent Drinking/Storage >1000-5000 Gallons

Scenario Description:

A permanent watering facility for livestockor wildlife constructed of approved materials with >1000-5000 gallons of capacity,to provide adequate quantity and quality of water for storage and or direct drinking access.

Before Situation:

This practice applies to all land uses where there is a need for new or improved watering facilities for livestock and or wildlife, where water is not available in sufficient quantities at specific locations, and habitat, water quality, plant productivity and health needs to be improved. Associated practices include: 516-Pipeline, 642-Water Well

After Situation:

A permanent watering facility is installed to ensure an adequate supply and quality of water for livestock or wildlife for storage and or direct drinking access. All watering facilities are constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation and placed on a properly prepared foundation with required plumbing.

Feature Measure: Capacity in Gallons

Scenario Unit: Gallons

Scenario Typical Size: 2,000.0

Scenario Total Cost: $4,211.33

Scenario Cost/Unit: $2.11

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$372.36	5	$1,861.80
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	13	$27.04
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$29.47	8	$235.76
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	8	$178.32
Plate compactor	1915	Manually guided vibratroy plate compactor. Equipment only.	Hours	$3.99	4	$15.96
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	8	$272.96
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	8	$193.52
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	8	$211.68
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	5.5	$165.39
Wildlife Escape Ramp	242	Pool size 15' x 30', for small mammals less than one pound	Each	$63.01	1	$63.01
Tank, Galvanized Steel Bottomless Livestock, <= 6,000 gallon	1069	Includes tank materials, shipping, and float valve, no liner	Gallons	$0.31	2000	$620.00
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	2	$130.18
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 614 - Watering Facility

Scenario: #4 - Permanent Drinking/Storage >5000 Gallons

Scenario Description:

A permanent watering facility for livestockor wildlife constructed of approved materials with >5000 gallons of capacity,to provide adequate quantity and quality of water for storage and or direct drinking access.

Before Situation:

This practice applies to all land uses where there is a need for new or improved watering facilities for livestock and or wildlife, where water is not available in sufficient quantities at specific locations, and habitat, water quality, plant productivity and health needs to be improved. Associated practices include: 516-Pipeline, 642-Water Well

After Situation:

A permanent watering facility is installed to ensure an adequate supply and quality of water for livestock or wildlife for storage and or direct drinking access. All watering facilities are constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation and placed on a properly prepared foundation with required plumbing.

Feature Measure: Capacity in Gallons

Scenario Unit: Gallons

Scenario Typical Size: 10,000.0

Scenario Total Cost: $11,227.38

Scenario Cost/Unit: $1.12

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$372.36	12	$4,468.32
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	26	$54.08
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$29.47	16	$471.52
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	16	$356.64
Plate compactor	1915	Manually guided vibratroy plate compactor. Equipment only.	Hours	$3.99	8	$31.92
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	16	$545.92
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	40	$967.60
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	20	$529.20
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	20	$906.80
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	11	$330.77
Wildlife Escape Ramp	242	Pool size 15' x 30', for small mammals less than one pound	Each	$63.01	1	$63.01
Tank, Galvanized Steel Bottomless Livestock, > 6,000 gallon	1070	Includes tank materials, shipping, and float valve, no liner	Gallons	$0.19	10000	$1,900.00
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	2	$130.18
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 614 - Watering Facility

Scenario: #5 - Frost Free Waterer

Scenario Description:
A frost/freeze free waterer for livestock constructed of approved materials that supplies adequate quantity and quality of water for direct drinking access. All watering facilities will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation.

Before Situation:
Confined animal facilities are adjacent or near surface or at risk ground water sources, resulting in water quality resource concerns.

After Situation:
Facilities are moved and adequate livestock water sources are provided protecting the surface and or ground water quality resources of concern.

Feature Measure: Number of facilities

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $1,190.49

Scenario Cost/Unit: $1,190.49

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$372.36	1	$372.36
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$29.47	1	$29.47
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	2	$48.38
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	2	$52.92
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic Yards	$28.74	0.5	$14.37
Tank, Freeze Proof, 2 hole	280	Tank, Freeze Proof with 2 drinking holes. Includes materials and shipping.	Each	$672.99	1	$672.99

Practice: 614 - Watering Facility

Scenario: #6 - Permanent Drinking/Storage >1000-5000 Gallons - remote locations

Scenario Description:

A permanent watering facility for livestockor wildlife constructed of approved materials with >1000-5000 gallons of capacity,to provide adequate quantity and quality of water for storage and or direct drinking access in remote areas that are more than 50 miles from source of equipment and/or materials.

Before Situation:

This practice applies to all land uses where there is a need for new or improved watering facilities for livestock and or wildlife, where water is not available in sufficient quantities at specific locations, and habitat, water quality, plant productivity and health needs to be improved. Associated practices include: 516-Pipeline, 642-Water Well

After Situation:

A permanent watering facility is installed to ensure an adequate supply and quality of water for livestock or wildlife for storage and or direct drinking access. All watering facilities are constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation and placed on a properly prepared foundation with required plumbing.

Feature Measure: Capacity in Gallons

Scenario Unit: Gallons

Scenario Typical Size: 2,000.0

Scenario Total Cost: $4,811.33

Scenario Cost/Unit: $2.41

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$372.36	5	$1,861.80
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	13	$27.04
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$29.47	8	$235.76
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	8	$178.32
Plate compactor	1915	Manually guided vibratroy plate compactor. Equipment only.	Hours	$3.99	4	$15.96
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	8	$272.96
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	8	$193.52
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	8	$211.68
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	5.5	$165.39
Wildlife Escape Ramp	242	Pool size 15' x 30', for small mammals less than one pound	Each	$63.01	1	$63.01
Tank, Galvanized Steel Bottomless Livestock, <= 6,000 gallon	1069	Includes tank materials, shipping, and float valve, no liner	Gallons	$0.31	2000	$620.00
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	600	$600.00
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	2	$130.18
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 614 - Watering Facility

Scenario: #19 - Portable Tank

Scenario Description:

A portable watering facility for livestock constructed of structural foam, polyethylene, galvanized steel or other similar UV resistant material of adequate strength, with 300 gallon capacity placed on the ground. This installation provides adequate quality and quantity of water for storage and or direct drinking access when coupled with a higher volume supply. All watering facilities will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. This watering facility will address the resource concerns of inadequate supply of water for livestock, habitat degradation, water quality, and undesirable plant productivity and health.

Before Situation:

This practice applies to all land uses where there is a need for new or improved watering facilities for livestock and or wildlife during the entire year, where water is not available in sufficient quantities at specific locations, and habitat, water quality, plant productivity and health needs to be improved.

After Situation:

A portable watering facility for livestock constructed of structural foam, polyethylene, galvanized steel or other similar UV resistant material of adequate strength, with 300 gallon capacity placed on the ground, with all tank materials, tank plumbing and float valve, to provide adequate water storage capacity to ensure an adequate supply and quality of water for livestock or wildlife for storage and or direct drinking access and provides improved plant productivity and health, water quality, and habitat. All watering facilities are constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation and installed with required plumbing. Portable tanks are ideal for management intensive grazing systems where adaptive management is required and typically increases the benefits realized. All needed pipelines are installed using Livestock Pipeline (516). All collectors or catchments for collecting precipitation will be addressed by using Water Harvesting Catchment (636). Any needed water source installation will use Water Well (642), Pumping Plant (533), Spring Development (574), or Livestock Pipeline (516) as appropriate. Areas around watering facilities where animal concentrations or overflow from the watering facility will cause resource concerns will be protected by using Heavy Use Area Protection (561) as appropriate.

Feature Measure: per tank

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $569.32

Scenario Cost/Unit: $569.32

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	2	$44.58
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	2	$48.38
Materials						
Post, Wood, CCA Treated, 4-5 in. X 7 ft.	1050	Wood Post, Line 4-5 inch dia. X 7 feet, CCA Treated. Includes materials and shipping only.	Each	$8.15	1	$8.15
Tank, Poly Livestock, >75 - 300 gallon	1064	Includes tank materials and float valve	Gallons	$1.29	300	$387.00
Tank, Float Valve Assembly	1077	Float Valve, Stem, Swivel, Float Ball	Each	$81.21	1	$81.21

Practice: 614 - Watering Facility

Scenario: #27 - Permanent Drinking/Storage >5000 Gal with Telemetry

Scenario Description:

A permanent watering facility for livestockor wildlife constructed of approved materials with >5000 gallons of capacity,to provide adequate quantity and quality of water for storage and or direct drinking access.

Before Situation:

This practice applies to all land uses where there is a need for new or improved watering facilities for livestock and or wildlife, where water is not available in sufficient quantities at specific locations, and habitat, water quality, plant productivity and health needs to be improved. Associated practices include: 516-Pipeline, 642-Water Well

After Situation:

A permanent watering facility is installed to ensure an adequate supply and quality of water for livestock or wildlife for storage and or direct drinking access. All watering facilities are constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation and placed on a properly prepared foundation with required plumbing. Data logger with remote telemetry allows the facility to be remotely monitored to protect scarce water supplies.

Feature Measure: Capacity in Gallons

Scenario Unit: Gallons

Scenario Typical Size: 10,000.0

Scenario Total Cost: $12,804.67

Scenario Cost/Unit: $1.28

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$372.36	12	$4,468.32
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	26	$54.08
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$29.47	16	$471.52
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	16	$356.64
Plate compactor	1915	Manually guided vibratroy plate compactor. Equipment only.	Hours	$3.99	8	$31.92
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	16	$545.92
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	40	$967.60
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	20	$529.20
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	20	$906.80
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	11	$330.77
Wildlife Escape Ramp	242	Pool size 15' x 30', for small mammals less than one pound	Each	$63.01	1	$63.01
Tank, Galvanized Steel Bottomless Livestock, > 6,000 gallon	1070	Includes tank materials, shipping, and float valve, no liner	Gallons	$0.19	10000	$1,900.00
Data Logger with Telemetry System	1454	Data Logger W/Graphic Output for water management and telemetry - data communication device with power supply in a weather proof enclosure. Equipment only.	Each	$1,577.29	1	$1,577.29
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	2	$130.18
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 620 - Underground Outlet

Scenario: #1 - Underground Outlet <=6 inch

Scenario Description:

Install 500 feet of 6" approved plastic pipe to convey stormwater from one location to a suitable and stable outlet. Costs include 6" SDR-35 pipe, Precast concrete drop inlet with steel grate, trench excavation, trench backfill, rodent guard and laid up stone headwall at outlet. This practice is often installed in conjunction with terraces, diversions, sediment control basins, waterways or simlar practices.

Before Situation:

Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds "T" from farm fields and other locations. Also, roof runoff or surface runoff that becomes contminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated.

After Situation:

Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

Feature Measure: Length of Conduit

Scenario Unit: Feet

Scenario Typical Size: 500.0

Scenario Total Cost: $4,691.99

Scenario Cost/Unit: $9.38

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, common earth, small equipment, 50 ft	1220	Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yards	$2.13	170	$362.10
Excavation, common earth, side cast, large equipment	1227	Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$1.38	170	$234.60
Compaction, earthfill, vibratory plate	1260	Compaction of earthfill with a walk behind vibratory plate compactor in typical 6-8 inch thick lifts, 2 passes. Includes equipment and labor.	Cubic Yards	$1.99	2	$3.98
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	2	$90.68
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic Yards	$84.32	1	$84.32
Pipe, PVC, 6 in., SDR 35	993	Materials: - 6 inch - PVC - SDR 35 - ASTM D3034	Feet	$5.31	500	$2,655.00
Catch Basin, concrete, 2 ft.x 2 ft. x 6 ft.	1257	Catch Basin, Precast Concrete, 2 ft. square or round, cast grate, 6 ft. deep. Includes materials, equipment and labor.	Each	$789.89	1	$789.89
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 620 - Underground Outlet

Scenario: #2 - Underground Outlet <=6 inch with Riser

Scenario Description:

Install 500 feet of 6" approved plastic pipe to convey stormwater from one location to a suitable and stable outlet. Costs include 6" HDPE corrugated single wall plastic tubing, 8" Perforated PVC Riser Inlet, trench excavation, trench backfill, rodent guard and laid up stone headwall at outlet. This practice is often installed in conjunction with terraces, diversions, sediment control basins, waterways or simlar practices.

Before Situation:

Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds "T" from farm fields and other locations. Also, roof runoff or surface runoff that becomes contminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated.

After Situation:

Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

Feature Measure: Length of Conduit

Scenario Unit: Feet

Scenario Typical Size: 500.0

Scenario Total Cost: $2,664.35

Scenario Cost/Unit: $5.33

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, common earth, small equipment, 50 ft	1220	Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yards	$2.13	105	$223.65
Trencher, wheel type	1259	Wheel type Trencher, typically 350 HP with 6' max depth. Equipment only.	Hours	$167.86	5	$839.30
Compaction, earthfill, vibratory plate	1260	Compaction of earthfill with a walk behind vibratory plate compactor in typical 6-8 inch thick lifts, 2 passes. Includes equipment and labor.	Cubic Yards	$1.99	2	$3.98
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	5	$132.30
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	2	$90.68
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic Yards	$84.32	1	$84.32
Pipe, HDPE, 6 in., CPT, Single Wall	1242	Pipe, Corrugated Plastic Tubing, Single Wall, 6 inch diameter - ASTM F405. Material cost only.	Feet	$1.17	500	$585.00
Inlet, riser, 8 in.	1262	Riser, polymer, complete vertical perforated UGO inlet with Tee, orifice plate if needed, 8 inch diameter. Materials only.	Each	$116.85	2	$233.70
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 620 - Underground Outlet

Scenario: #3 - Underground Outlet - 8-12 inch

Scenario Description:

Install 500 feet of 10" approved plastic pipe to convey stormwater from one location to a suitable and stable outlet. Costs include 10" HDPE pipe, Precast concrete drop inlet with steel grate, trench excavation, trench backfill, rodent guard and laid up stone headwall at outlet. This practice is often installed in conjunction with terraces, diversions, sediment control basins, waterways or simlar practices.

Before Situation:

Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds "T" from farm fields and other locations. Also, roof runoff or surface runoff that becomes contminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated.

After Situation:

Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

Feature Measure: Length of Conduit

Scenario Unit: Feet

Scenario Typical Size: 500.0

Scenario Total Cost: $5,998.07

Scenario Cost/Unit: $12.00

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, common earth, small equipment, 50 ft	1220	Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yards	$2.13	210	$447.30
Excavation, common earth, side cast, large equipment	1227	Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$1.38	210	$289.80
Compaction, earthfill, vibratory plate	1260	Compaction of earthfill with a walk behind vibratory plate compactor in typical 6-8 inch thick lifts, 2 passes. Includes equipment and labor.	Cubic Yards	$1.99	2	$3.98
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	4	$181.36
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic Yards	$84.32	1	$84.32
Pipe, HDPE, CPT, Double Wall, Soil Tight, 10 in.	1243	Pipe, Corrugated HDPE Double Wall, 10 inch diameter with soil tight joints - AASHTO M252. Material cost only.	Feet	$7.46	500	$3,730.00
Catch Basin, concrete, 2 ft.x 2 ft. x 6 ft.	1257	Catch Basin, Precast Concrete, 2 ft. square or round, cast grate, 6 ft. deep. Includes materials, equipment and labor.	Each	$789.89	1	$789.89
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 620 - Underground Outlet

Scenario: #4 - Underground Outlet - 8-12 inch with Riser

Scenario Description:

Install 500 feet of 10" approved plastic pipe to convey stormwater from one location to a suitable and stable outlet. Costs include 10" HDPE pipe, and 10" Perforated PVC Riser Inlet, trench excavation, trench backfill, rodent guard and laid up stone headwall at outlet. This practice is often installed in conjunction with terraces, diversions, sediment control basins, waterways or simlar practices.

Before Situation:

Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds "T" from farm fields and other locations. Also, roof runoff or surface runoff that becomes contminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated.

After Situation:

Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

Feature Measure: Length of Conduit

Scenario Unit: Feet

Scenario Typical Size: 500.0

Scenario Total Cost: $6,213.74

Scenario Cost/Unit: $12.43

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, common earth, small equipment, 50 ft	1220	Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yards	$2.13	210	$447.30
Trencher, wheel type	1259	Wheel type Trencher, typically 350 HP with 6' max depth. Equipment only.	Hours	$167.86	5	$839.30
Compaction, earthfill, vibratory plate	1260	Compaction of earthfill with a walk behind vibratory plate compactor in typical 6-8 inch thick lifts, 2 passes. Includes equipment and labor.	Cubic Yards	$1.99	2	$3.98
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	5	$132.30
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	4	$181.36
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic Yards	$84.32	1	$84.32
Pipe, HDPE, CPT, Double Wall, Soil Tight, 10 in.	1243	Pipe, Corrugated HDPE Double Wall, 10 inch diameter with soil tight joints - AASHTO M252. Material cost only.	Feet	$7.46	500	$3,730.00
Inlet, riser, 10 in.	1263	Riser, polymer, complete vertical perforated UGO inlet with Tee, orifice plate if needed, 10 inch diameter. Materials only.	Each	$161.88	2	$323.76
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 620 - Underground Outlet

Scenario: #5 - Underground Outlet - 14-18 inch

Scenario Description:

Install 500 feet of 18" approved plastic pipe to convey stormwater from one location to a suitable and stable outlet. Costs include 18" HDPE pipe, Precast concrete drop inlet with steel grate, trench excavation, bedding material, trench backfill, rodent guard and laid up stone headwall at outlet. This practice is often is installed in conjunction with terraces, diversions, sediment control basins, waterways or simlar practices.

Before Situation:

Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds "T" from farm fields and other locations. Also, roof runoff or surface runoff that becomes contminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated.

After Situation:

Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

Feature Measure: Length of Conduit

Scenario Unit: Feet

Scenario Typical Size: 500.0

Scenario Total Cost: $13,198.47

Scenario Cost/Unit: $26.40

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, common earth, small equipment, 50 ft	1220	Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yards	$2.13	330	$702.90
Excavation, common earth, side cast, large equipment	1227	Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$1.38	330	$455.40
Compaction, earthfill, vibratory plate	1260	Compaction of earthfill with a walk behind vibratory plate compactor in typical 6-8 inch thick lifts, 2 passes. Includes equipment and labor.	Cubic Yards	$1.99	2	$3.98
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	4	$181.36
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic Yards	$84.32	1	$84.32
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	60	$1,804.20
Pipe, HDPE, CPT, Double Wall, Soil Tight, 18 in.	1245	Pipe, Corrugated HDPE Double Wall, 18 inch diameter with soil tight joints - AASHTO M294. Material cost only.	Feet	$17.41	500	$8,705.00
Catch Basin, concrete, 2 ft.x 2 ft. x 6 ft.	1257	Catch Basin, Precast Concrete, 2 ft. square or round, cast grate, 6 ft. deep. Includes materials, equipment and labor.	Each	$789.89	1	$789.89
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 620 - Underground Outlet

Scenario: #6 - Underground Outlet - 20-24 inch

Scenario Description:

Install 500 feet of 24" approved plastic pipe to convey stormwater from one location to a suitable and stable outlet. Costs include 24" HDPE pipe, Precast concrete drop inlet with steel grate, 24" HDPE pipe, trench excavation, bedding material, trench backfill, rodent guard and laid up stone headwall at outlet. Practice is often installed in conjunction with terraces, diversions, sediment control basins, waterways or simlar practices.

Before Situation:

Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds "T" from farm fields and other locations. Also, roof runoff or surface runoff that becomes contminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated.

After Situation:

Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

Feature Measure: Length of Conduit

Scenario Unit: Feet

Scenario Typical Size: 500.0

Scenario Total Cost: $20,568.87

Scenario Cost/Unit: $41.14

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, common earth, small equipment, 50 ft	1220	Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yards	$2.13	445	$947.85
Excavation, common earth, side cast, large equipment	1227	Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$1.38	445	$614.10
Compaction, earthfill, vibratory plate	1260	Compaction of earthfill with a walk behind vibratory plate compactor in typical 6-8 inch thick lifts, 2 passes. Includes equipment and labor.	Cubic Yards	$1.99	2	$3.98
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	4	$181.36
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic Yards	$84.32	1	$84.32
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	85	$2,555.95
Pipe, HDPE, CPT, Double Wall, Soil Tight, 24 in.	1246	Pipe, Corrugated HDPE Double Wall, 24 inch diameter with soil tight joints - AASHTO M294. Material cost only.	Feet	$29.84	500	$14,920.00
Catch Basin, concrete, 2 ft.x 2 ft. x 6 ft.	1257	Catch Basin, Precast Concrete, 2 ft. square or round, cast grate, 6 ft. deep. Includes materials, equipment and labor.	Each	$789.89	1	$789.89
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 620 - Underground Outlet

Scenario: #7 - Underground Outlet - 25-30 inch

Scenario Description:

Install 500 feet of 30" approved plastic pipe to convey stormwater from one location to a suitable and stable outlet. Costs include 30" HDPE pipe, Precast concrete drop inlet with steel grate, trench excavation, bedding material, trench backfill, rodent guard and laid up stone headwall at outlet. This practices is often installed in conjunction with terraces, diversions, sediment control basins, waterways or simlar practices.

Before Situation:

Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds "T" from farm fields and other locations. Also, roof runoff or surface runoff that becomes contminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated.

After Situation:

Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

Feature Measure: Length of Conduit

Scenario Unit: Feet

Scenario Typical Size: 500.0

Scenario Total Cost: $27,923.86

Scenario Cost/Unit: $55.85

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, common earth, small equipment, 50 ft	1220	Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yards	$2.13	565	$1,203.45
Excavation, common earth, side cast, large equipment	1227	Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$1.38	565	$779.70
Compaction, earthfill, vibratory plate	1260	Compaction of earthfill with a walk behind vibratory plate compactor in typical 6-8 inch thick lifts, 2 passes. Includes equipment and labor.	Cubic Yards	$1.99	2	$3.98
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	4	$181.36
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic Yards	$84.32	1	$84.32
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	105	$3,157.35
Pipe, HDPE, CPT, Double Wall, Soil Tight, 30 in.	1247	Pipe, Corrugated HDPE Double Wall, 30 inch diameter with soil tight joints - AASHTO M294. Material cost only.	Feet	$41.79	500	$20,895.00
Catch Basin, concrete, 3 ft. x 3 ft. x 6 ft.	1258	Catch Basin, Precast Concrete, 3 feet square or round, cast grate, 6 feet deep. Includes materials, equipment and labor.	Each	$1,147.28	1	$1,147.28
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 620 - Underground Outlet

Scenario: #8 - Underground Outlet - >30 inch

Scenario Description:

Install 500 feet of 36" approved plastic pipe to convey stormwater from one location to a suitable and stable outlet. Costs include 36" HDPE pipe, Precast concrete drop inlet with steel grate, trench excavation, bedding material, trench backfill, rodent guard and laid up stone headwall at outlet. This practice is often installed in conjunction with terraces, diversions, sediment control basins, waterways or simlar practices.

Before Situation:

Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds "T" from farm fields and other locations. Also, roof runoff or surface runoff that becomes contminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated.

After Situation:

Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

Feature Measure: Length of Conduit

Scenario Unit: Feet

Scenario Typical Size: 500.0

Scenario Total Cost: $35,239.71

Scenario Cost/Unit: $70.48

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, common earth, small equipment, 50 ft	1220	Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yards	$2.13	690	$1,469.70
Excavation, common earth, side cast, large equipment	1227	Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$1.38	690	$952.20
Compaction, earthfill, vibratory plate	1260	Compaction of earthfill with a walk behind vibratory plate compactor in typical 6-8 inch thick lifts, 2 passes. Includes equipment and labor.	Cubic Yards	$1.99	2	$3.98
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	4	$181.36
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic Yards	$84.32	1	$84.32
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	135	$4,059.45
Pipe, HDPE, CPT, Double Wall, Soil Tight, 36 in.	1248	Pipe, Corrugated HDPE Double Wall, 36 inch diameter with soil tight joints - AASHTO M294. Material cost only.	Feet	$53.74	500	$26,870.00
Catch Basin, concrete, 3 ft. x 3 ft. x 6 ft.	1258	Catch Basin, Precast Concrete, 3 feet square or round, cast grate, 6 feet deep. Includes materials, equipment and labor.	Each	$1,147.28	1	$1,147.28
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 629 - Waste Treatment

Scenario: #1 - Litter Windrow Pasteurization

Scenario Description:

This practice scenario includes the in house windrowing of poultry litter to promote pasteurization between flocks. The purpose of the practice is to address resource concerns related to water quality degradation due to (excess nutrient and pathogens) and air quality impacts (PM & PM precursors, and objectionable odors). Associated practices: Amendments for Treatment of Agricultural Waste (591), Waste Storage Facility (313), & Nutrient Management (590)

Before Situation:

A poultry operation typically removes part of the litter and bedding between flocks, called a cakeout. A full cleanout of litter and bedding is typically done once every 1-3 years depending on the operation. Over time, the accumulation of poultry waste in the litter contributes to an increase in odors and high ammonia emissions in the house contribute to impacts on bird health.

After Situation:

This scenario assumes 4 flocks per year in an operation with 2 - 42 x 500 square foot houses. Three (3) in-house pasteurization events will be performed annually. There will be a full cleanout after the 4th flock. Formula to calculate the total number of pasteurization events per year on a 1000 SF basis: (Square Feet of house) / 1000 SF X (Number of houses) X (Number of pasteurization events) = Number of 1000SF. 21,000 SF / 1000 SF X 2 houses X 3 events = 126 units of 1000SF In house pasteurization of poultry litter is achieved by windrowing the litter in the house. The process takes approximately one week. This process successfully addresses the air quality impacts (ammonia emissions, PM and PM precursors) and bird health resource concerns. This process also improves the quality of poultry litter that must be spread on farmland. Bird health is improved and bird mortality is reduced.

Feature Measure: Surface Area of housing floor windr

Scenario Unit: 1,000 Square Foot

Scenario Typical Size: 126.0

Scenario Total Cost: $5,233.44

Scenario Cost/Unit: $41.54

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$46.88	66	$3,094.08
Aerator Attachment, 8 in., PTO	1707	Aerator attachment for mounting to tractor and PTO, 8 inch diameter. Equipment cost only with out tractor. Brown Bear R24C-8' or equivalent	Hours	$13.10	30	$393.00
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	66	$1,746.36

Practice: 629 - Waste Treatment

Scenario: #2 - Milking Parlor Waste Treatment System with Dosing System and Bed

Scenario Description:

This practice scenario includes a dosed treatment system with bark bed for milking parlor wastewater. The purpose of the practice is to address resource concerns related to water quality degradation due to (excess nutrient, salts and pathogens). Associated practices: Nutrient Management (590), Pumping Plant (533), Fence (382), & Waste Storage Facility (313)

Before Situation:

Milkhouse waste water currently outlets in an untreated manner which presents potential soil, water and air quality concerns.

After Situation:

This scenario assumes that the treatment system is designed for 500 gal/day of wastewater from the milking parlor. It assumes a two tank scenario. The grease trap acts as the primary settling basin. The wastewater overflows into the septic tank, which is then dosed to the treatment bed (bark bed or leaching gallery). It is assumed that the treatment bed is dosed at 0.16 gal/square ft (3125 sq ft). To maintain bark bed performance, additional bark may need to be added every 3 to 5 years as an O&M task. This practice scenario reduces nutrient content, organic strength, or pathogen levels of agricultural waste; improve air quality by reducing odors and gaseous emissions (methane or ammonia).

Feature Measure: Design Flow

Scenario Unit: Gallons per Day

Scenario Typical Size: 500.0

Scenario Total Cost: $33,819.92

Scenario Cost/Unit: $67.64

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$109.25	1	$109.25
Equipment Installation						
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$5.40	118	$637.20
Trenching, Earth, 12 in. x 48 in.	53	Trenching, earth, 12 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling	Feet	$1.24	450	$558.00
Aggregate, Wood Chips	1098	Includes materials, equipment and labor	Cubic Yards	$50.28	350	$17,598.00
Stripping and stockpiling, topsoil	1199	Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor.	Cubic Yards	$0.87	116	$100.92
Excavation, common earth, large equipment, 150 ft	1223	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yards	$3.64	254	$924.56
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	32	$1,091.84
Materials						
Pipe, PVC, 2 in., SCH 40	976	Materials: - 2 inch - PVC - SCH 40 - ASTM D1785	Feet	$1.27	290	$368.30
Pipe, PVC, 4 in., SCH 40	978	Materials: - 4 inch - PVC - SCH 40 - ASTM D1785	Feet	$3.74	10	$37.40
Pipe, PVC, 6 in., SCH 40	980	Materials: - 6 inch - PVC - SCH 40 - ASTM D1785	Feet	$6.58	200	$1,316.00
Pipe, PE, 2 in., DR 9	1000	Materials: - 2 inch - PE - 160 psi - ASTM D3035 DR 9	Feet	$2.31	250	$577.50
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic Yards	$22.79	119	$2,712.01
Geotextile, non-woven, light weight	1209	Non-woven less than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only.	Square Yard	$1.64	382	$626.48
Prefabricated concrete septic tank, 1500 gal	1738	Precast concrete septic tank, 1,500 gal. Materials only.	Each	$2,176.49	2	$4,352.98
Dosing System, siphon	1763	Dosing system siphon with typical 3 inch diameter and 12 inch drawdown. Includes materials and shipping only.	Each	$245.06	1	$245.06
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	2	$130.18

Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	4	$634.12
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	4	$1,800.12

Practice: 629 - Waste Treatment

Scenario: #3 - Milking Parlor Waste Treatment System with Dosing System

Scenario Description:

This practice scenario includes a dosed treatment system for milking parlor wastewater that will outlet to a constructed wetland and/or vegetated treatment area and/or other acceptable treatment. The purpose of the practice is to address resource concerns related to water quality degradation due to (excess nutrient, salts and pathogens). Associated practices: Constructed Wetland (656), Vegetated Treatment Area (635), Waste Transfer (634), Nutrient Management (590), Pumping Plant (533), Fence (382), & Waste Storage Facility (313)

Before Situation:

Milkhouse waste water currently outlets in an untreated manner which presents potential soil, water and air quality concerns.

After Situation:

This scenario assumes that the treatment system is designed for 500 gal/day of wastewater from the milking parlor. It assumes a two tank scenario. The grease trap acts as the primary settling basin. The wastewater overflows into the septic tank, which is then dosed to a treatment area (constructed wetland and/or vegetated treatment area and/or other acceptable treatment). This practice scenario reduces nutrient content, organic strength, or pathogen levels of agricultural waste; improve air quality by reducing odors and gaseous emissions (methane or ammonia).

Feature Measure: Design Flow

Scenario Unit: Gallons per Day

Scenario Typical Size: 500.0

Scenario Total Cost: $11,477.02

Scenario Cost/Unit: $22.95

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$109.25	1	$109.25
Equipment Installation						
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$5.40	118	$637.20
Trenching, Earth, 12 in. x 48 in.	53	Trenching, earth, 12 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling	Feet	$1.24	450	$558.00
Excavation, common earth, large equipment, 150 ft	1223	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yards	$3.64	138	$502.32
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	16	$545.92
Materials						
Pipe, PVC, 6 in., SCH 40	980	Materials: - 6 inch - PVC - SCH 40 - ASTM D1785	Feet	$6.58	200	$1,316.00
Pipe, PE, 2 in., DR 9	1000	Materials: - 2 inch - PE - 160 psi - ASTM D3035 DR 9	Feet	$2.31	250	$577.50
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic Yards	$22.79	3	$68.37
Prefabricated concrete septic tank, 1500 gal	1738	Precast concrete septic tank, 1,500 gal. Materials only.	Each	$2,176.49	2	$4,352.98
Dosing System, siphon	1763	Dosing system siphon with typical 3 inch diameter and 12 inch drawdown. Includes materials and shipping only.	Each	$245.06	1	$245.06
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	2	$130.18
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	4	$634.12
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	4	$1,800.12

Practice: 629 - Waste Treatment

Scenario: #4 - Aerator less than or equal to 5 hp

Scenario Description:

This practice scenario includes installation of an aerator into a liquid storage pond or tank that has a surface area less than 1 acre. The purpose of the practice is to address resource concerns related to water quality degradation due to (excess nutrient and pathogens) and air quality impacts (PM & PM precursors, and objectionable odors). Associated practices: Nutrient Management (590) and Waste Storage Facility (313)

Before Situation:

A dairy, swine, or other agricultural operation in which the waste goes into a storage pond. The pond is not managed as an anaerobic lagoon and the nutrients stratify over time and odors are objectionable. It is difficult to properly estimate the nutrient content being pumped onto the land because of the stratification. There is also not enough aerobic microbial activity in the pond to prevent objectionable odors.

After Situation:

This scenario assumes that the producer would like to increase oxygen content in the storage pond and mix the waste for even nutrient distribution. Under aerobic conditions microorganisms can convert nutrients and odors will be reduced. Nutrient content of the liquid waste is more uniform which is better for uniform agronomic application rates improving nutrient management and to protect air and water quality resources.

Feature Measure: Horse Power of aerator

Scenario Unit: Horsepower

Scenario Typical Size: 1.0

Scenario Total Cost: $1,276.24

Scenario Cost/Unit: $1,276.24

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	2	$68.24
Materials						
Aerator, pond, 1 hp	1708	1 hp Aerator for pond or tank with less than 10 acres of surface area. Materials only.	Each	$1,208.00	1	$1,208.00

Practice: 629 - Waste Treatment

Scenario: #5 - Aerator greater than 5 hp

Scenario Description:

This practice scenario includes installation of an aerator into a liquid storage pond or tank with a surface area larger than 1 acre. The purpose of the practice is to address resource concerns related to water quality degradation due to (excess nutrient and pathogens) and air quality impacts (PM & PM precursors, and objectionable odors). Associated practices: Nutrient Management (590) and Waste Storage Facility (313)

Before Situation:

A dairy, swine, or other agricultural operation in which the waste goes into a storage pond. The pond is not managed as an anaerobic lagoon and the nutrients stratify over time and odors are objectionable. It is difficult to properly estimate the nutrient content being pumped onto the land because of the stratification. There is also not enough aerobic microbial activity in the pond to prevent objectionable odors.

After Situation:

This scenario assumes that the producer would like to increase oxygen content in the storage pond and mix the waste for even nutrient distribution. Under aerobic conditions microorganisms can convert nutrients and odors will be reduced. Nutrient content of the liquid waste is more uniform which is better for uniform agronomic applications rates improving nutrient management and to protect air and water quality resources.

Feature Measure: Horse Power of aerator

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $11,533.03

Scenario Cost/Unit: $11,533.03

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	3	$102.36
Materials						
Aerator or Circulator, Pond, Large	1709	Aerator or Circulator for pond or tank, 10 or more HP and/or 10 or more acres of surface area. Materials only	Each	$11,430.67	1	$11,430.67

Practice: 629 - Waste Treatment

Scenario: #6 - Straw Pond Cover

Scenario Description:

This practice scenario is a permeable organic cover applied to the liquid surface of a waste storage facility that has a surface area less than or equal to 2 acres. Straw cover applications can remain on top of the pond for between 2 and 6 months. The cover will reduce radiation and wind velocity over the surface of a manure storage to reduce transmission of odors and act as a medium for growth of microorganisms that utilize carbon, nitrogen, and sulfur to decompose odorous compounds. Associated practices include Waste Storage Facility (313).

Before Situation:

This practice is applicable on a dairy or swine operation in which the waste goes into a liquid storage pond or tank and the bio-treatment of emissions will improve air quality. The maximum recommended surface area is 2 acres.

After Situation:

Permeable organic cover applied to the liquid surface of a waste storage or treatment facility. Organic materials often used as covers include straws, cornstalks and peat moss. Typical application is an 8" straw application on a 120' diameter storage tank every 3 months. The scenario unit calculation is (Surface Area of Pond)*(Number of applications per year). For this scenario, the calculation is: (120/2)^2*pi *4 = 45,239sf Organic covers can reduce odors up to 90 percent if the straw cover is 12" deep.

Feature Measure: Surface Area of Pond or Tank per a

Scenario Unit: Square Feet

Scenario Typical Size: 45,239.0

Scenario Total Cost: $19,344.88

Scenario Cost/Unit: $0.43

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Brush Chipper, 6 in. capacity	938	Brush Chipper, 6 inch capacity, typically 35 HP. Includes chipper and power unit. Labor not included.	Hours	$28.03	40	$1,121.20
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$46.88	16	$750.08
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	16	$423.36
Materials						
Straw	1237	Small grain straw (non organic and certified organic). Includes materials only.	Ton	$65.00	242.8	$15,782.00
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	8	$1,268.24

Practice: 632 - Waste Separation Facility

Scenario: #1 - Mechanical Separation Facility

Scenario Description:

A small mechanical separation facility to partition solids, liquids, and/or associated nutrients from animal waste streams. The partitioning of the previously mentioned components facilitates the protection of air and water quality, protects animal health, and improves the management of an animal waste management system. Mechanical separators may include, but are not limited to: static inclined screens , vibratory screens, rotating screens, centrifuges, screw or roller presses, or other systems. Associated practices include Nutrient Management (590), Composting Facility (317), Anaerobic Digester (366), Waste Storage Facility (313), Waste Recycling (633), Waste Transfer (634), Amendments for the Treatment of Agricultural Waste (591), Pumping Plant (533), Vegetated Treatment Area (635), Pond Lining or Sealing (521A-D), and Waste Treatment (629).

Before Situation:

Applicable to situations where partitioning solids, liquids, and nutrients will facilitate the management of an animal waste management system, improve air quality (reduce odors), and address water quality concerns.

After Situation:

One small mechanical separation facility (a vibratory or rotating screen) installed at livestock facility before storage or treatment or after treatment, for example, after an anaerobic digester. Part of an animal waste management system.

Feature Measure: Item

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $42,938.35

Scenario Cost/Unit: $42,938.35

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$372.36	10	$3,723.60
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	16	$545.92
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	32	$774.08
Materials						
Vibratory or Rotating Screen	1948	Vibratory or Rotating Screen, includes materials, shipping and equipment.	Each	$36,911.00	1	$36,911.00
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	3	$195.27
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	2	$317.06
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 632 - Waste Separation Facility

Scenario: #2 - Earthen Settling Structure

Scenario Description:

An earthen structure, such as a basin or a terrace or dike like structure, used to capture and separate a portion of the solids from a liquid stream from a feedlot or confinement facility. A concrete pad should be installed on the bottom of the basin and around outlet structures to facilitate cleanout. Removes as portion of the solids to facilitate waste handling and to address water quality concerns. Associated practices include Nutrient Management (590), Composting Facility (317), Anaerobic Digester (366), Waste Storage Facility (313), Waste Recycling (633), Waste Transfer (634), Vegetated Treatment Area (635), Pond Lining or Sealing (521A-D), and Waste Treatment (629).

Before Situation:

Applicable to situations where partitioning solids, liquids, and nutrients will facilitate the management of an animal waste management system, improve air quality (reduce odors), and address water quality concerns.

After Situation:

One earthen settling basin structure (60 ft top width by 200 ft top length by 3 ft deep with 2.5:1 side slopes, with three screening outlet structures) constructed around or at a livestock feeding operation. Removes a portion of the solids that otherwise would leave with the runoff from an animal feeding operation. Part of an animal waste management system.

Feature Measure: Cubic Foot of Design Storage

Scenario Unit: Cubic Feet

Scenario Typical Size: 30,000.0

Scenario Total Cost: $13,098.09

Scenario Cost/Unit: $0.44

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$372.36	12	$4,468.32
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	1000	$2,080.00
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	1000	$4,190.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	8	$193.52
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	14	$420.98
Weeping Wall	1765	Weeping wall or picket screen structure for solid settling basin. Materials only.	Feet	$22.80	24	$547.20
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	3	$195.27
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	2	$317.06
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	1	$450.03

Practice: 632 - Waste Separation Facility

Scenario: #3 - Concrete Basin

Scenario Description:

A concrete structure, such as a basin with concrete walls and floor, used to capture and separate a portion of the solids from a liquid stream from a feedlot or confinement facility. Removes as portion of the solids to facilitate waste handling and to address water quality concerns. Associated practices include Nutrient Management (590), Composting Facility (317), Anaerobic Digester (366), Waste Storage Facility (313), Waste Recycling (633), Waste Transfer (634), Pumping Plant (533), Vegetated Treatment Area (635), Pond Lining or Sealing (521A-D), and Waste Treatment (629).

Before Situation:

Applicable to situations where partitioning solids, liquids, and nutrients will facilitate the management of an animal waste management system, improve air quality (reduce odors), and address water quality concerns.

After Situation:

One concrete settling basin structure (20 ft wide by 30 ft long with 3 ft high walls and weeping wall/picket structure or outlet control) constructed around or at a livestock feeding operation. Removes a portion of the solids that otherwise would leave with the runoff from an animal feeding operation. Part of an animal waste management system.

Feature Measure: Cubic Foot of Design Storage

Scenario Unit: Cubic Feet

Scenario Typical Size: 1,800.0

Scenario Total Cost: $13,273.75

Scenario Cost/Unit: $7.37

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$372.36	12	$4,468.32
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$494.40	12	$5,932.80
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.37	50	$68.50
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	50	$104.00
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	50	$209.50
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	8	$193.52
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	32	$962.24
Weeping Wall	1765	Weeping wall or picket screen structure for solid settling basin. Materials only.	Feet	$22.80	6	$136.80
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	3	$195.27
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	2	$317.06
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	1	$450.03

Practice: 632 - Waste Separation Facility

Scenario: #4 - Concrete Basin, Multiple Cells, Gravity

Scenario Description:

A concrete basin containing multiple cells with concrete walls and floor. Basin cells use gravity and time to separate a portion of the solids from a liquid waste stream from a drylot dairy, animal production or confinement facility. Often used where manure is cleaned by flushing. Use of multiple separation cells allows for the continuous operation and management of the waste stream to be altered between cells thereby providing time for the solids portion to drain to be handled as a solid, according to the nutrient management plan. Removes a portion of the solids to facilitate waste handling and to address water quality concerns. Associated practices include Nutrient Management (590), Composting Facility (317), Anaerobic Digester (366), Waste Storage Facility (313), Waste Recycling (633), Waste Transfer (634), Pumping Plant (533), Vegetated Treatment Area (635), Pond Lining or Sealing (521A-D), and Waste Treatment (629).

Before Situation:

Applicable to situations and locations where partitioning solids, liquids, and nutrients will facilitate the management of an animal waste management system, improve air quality (reduce odors), and address water quality concerns.

After Situation:

One concrete gravity settling basin containing multiple cells. The multi cell basin structure is 70 feet wide by 80 ft long and 6 ft deep with an additional 10:1 entrance ramp. There are three cells to the basin with a clean out ramp the width of the structure on just one end. The center cell, used to drain the liquid portion, has 6 ft reinforced concrete "T" walls with weeping wall structures. The center cell design volume is considered no more than half full to maintain drainage of the facility. The two outside cells collecting the separated solids (25 ft x 80 ft x 6 ft plus ramp storage) have outside walls that are designed to store the solid settled portion of the waste. The waste stream enters the basin at either of the outside cells via a waste transfer component, the liquid portion of the waste flows into the center cell where it is then pumped to a waste storage facility. The pump and long-term liquid and solid waste storage facilities are contracted separately. Basin removes a portion of the solids that otherwise make handling the waste stream solids content difficult to manage over time. Part of an animal waste and nutrient management system.

Feature Measure: Cubic Foot of Design Storage

Scenario Unit: Cubic Feet

Scenario Typical Size: 26,250.0

Scenario Total Cost: $133,016.67

Scenario Cost/Unit: $5.07

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$372.36	154	$57,343.44
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$494.40	133	$65,755.20
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	570	$1,185.60
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	182	$762.58
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	16	$387.04
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	182	$5,472.74
Weeping Wall	1765	Weeping wall or picket screen structure for solid settling basin. Materials only.	Feet	$22.80	40	$912.00
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	3	$195.27
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	2	$317.06
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	1	$450.03

Practice: 632 - Waste Separation Facility

Scenario: #5 - Concrete Sand Settling Lane

Scenario Description:

A concrete structure, a concrete lane with curbs, used to capture and separate a portion of the solids, mainly sand, from a liquid stream from a confinement facility. Removes as portion of the solids to facilitate waste handling and to address water quality concerns. Associated practices include Nutrient Management (590), Composting Facility (317), Anaerobic Digester (366), Waste Storage Facility (313), Waste Recycling (633), Waste Transfer (634), Pumping Plant (533), Vegetated Treatment Area (635), Pond Lining or Sealing (521A-D), and Waste Treatment (629).

Before Situation:

Applicable to situations where partitioning solids, liquids, and nutrients will facilitate the management of an animal waste management system, improve air quality (reduce odors), and address water quality concerns.

After Situation:

One concrete settling lane structure (25 ft wide by 200 ft long by 0.5 ft thick) constructed around or at a livestock feeding operation. Removes a portion of the solids (sand) that otherwise would leave with the runoff from an animal feeding operation. Part of an animal waste management system.

Feature Measure: Square Foot of Settling Lane Footpr

Scenario Unit: Square Feet

Scenario Typical Size: 5,000.0

Scenario Total Cost: $48,056.27

Scenario Cost/Unit: $9.61

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$372.36	90	$33,512.40
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$494.40	20	$9,888.00
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	180	$374.40
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	90	$377.10
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	90	$2,706.30
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	3	$195.27
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	2	$317.06
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	1	$450.03

Practice: 632 - Waste Separation Facility

Scenario: #12 - Medium Sized Mechanical Separation Facility

Scenario Description:

A Medium mechanical separation facility to partition solids, liquids, and/or associated nutrients from animal waste streams. The partitioning of the previously mentioned components facilitates the protection of air and water quality, protects animal health, and improves the management of an animal waste management system. Mechanical separators may include, but are not limited to: static inclined screens , vibratory screens, rotating screens, centrifuges, screw or roller presses, or other systems. This will address water quality. Associated practices include Nutrient Management (590), Composting Facility (317), Anaerobic Digester (366), Waste Storage Facility (313), Waste Recycling (633), Waste Transfer (634), Amendments for the Treatment of Agricultural Waste (591), Pumping Plant (533), Vegetated Treatment Area (635), Pond Lining or Sealing (520, 521, 522), and Waste Treatment (629).

Before Situation:

Applicable to situations where partitioning solids, liquids, and nutrients will facilitate the management of an animal waste management system, improve air quality (reduce odors), and address water quality concerns.

After Situation:

One medium mechanical separation facility (a vibratory or rotating screen) installed at livestock facility before storage or treatment or after treatment, for example, after an anaerobic digester. Part of an animal waste management system.

Feature Measure: Item

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $73,656.08

Scenario Cost/Unit: $73,656.08

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$372.36	20	$7,447.20
Excavation, common earth, large equipment, 50 ft	1222	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yards	$1.54	22	$33.88
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	16	$545.92
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	32	$774.08
Materials						
Screw or Roller Press - Large	1951	Screw or Roller Press with a capacity of => 100 GPM. Includes materials and equipment.	Each	$63,871.25	1	$63,871.25
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	3	$195.27
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	2	$317.06
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 633 - Waste Recycling

Scenario: #1 - Export Ag Waste By-products Recycled for Use Off Farm

Scenario Description:

Agricultural by-products on the farm are in excess of the ability of the farm and limited crop landbase to utilize. These waste materials are accumulating in such a manner that the water, soil and/or air quality have resource concerns. The application of a waste management plan will recycle these by-products such that the quality of the natural resources will be improved and the environment protected. The agricultural by-products are tested and exported off the farm operation for external uses. Records are kept detailing disposition of the waste, including date, amount, and receiver of the waste. Results of the agricultural by-product laboratory analysis is also provided to the receiver. Associated practices: 313-Waste Storage Facility, 317-Composting Facility, 590-Nutrient Management

Before Situation:

Agricultural by-products are produced or accumulated on the farm in amounts that cannot be utilized by the farm without causing resource concerns such as degradation of water quality, soil health and/or air quality.

After Situation:

Twice a year the excess agricultural by-products that have been collected at the farm are sampled and laboratory tested to determine the characteristics of the waste material that is recycled. The results of this analysis will determine the basis of its use. The agricultural by-products are then handled according to the waste management system plan. The intended off-farm use of the recycled agricultural waste by-products will refer to the laboratory analysis. Records shall be kept of the analysis, dates and quantities of recycled waste exported.

Feature Measure: Farm

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $484.10

Scenario Cost/Unit: $484.10

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	4	$181.36
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	2	$222.42
Materials						
Test, Manure Analysis	306	Moisture, Total N, P, K. Includes materials and shipping only.	Each	$40.16	2	$80.32

Practice: 633 - Waste Recycling

Scenario: #2 - Import Non-Ag Waste By-products, Compost with Manure for Use On Farm

Scenario Description:

A farm has soil quality reasource concerns. The farm also has an energy goal to reduce their use of transportation fuels and is interested in utilizing locally available material. The farm is located near a food processor that has excess waste available for recycling. The farm has agreed to receive an amount of waste material which it plans to mix with animal manure solids. This blended waste material will be composted. The finished compost product will be used both for animal bedding and land applied as a soil amendment and nutrient source. The land applied material will comply with the nutrient management plan for agronomic crop nutrient utilization. Records are kept to document the methods and utilization of the non-agricultural products for agricultural purposes. Associated practices: 313-Waste Storage Facility, 317-Composting Facility, 590-Nutrient Management

Before Situation:

A farm has a soil quality reasource concerns. The operator also has an energy goal to reduce the farm associated transportation fuels. Additional soil amendments could improve their soil quality but the local fertilizer dealer imports all their material by truck from out of state. Other non-agricultural by-products are locally available but cannot be applied directly on the land. The farm may be able to generate beneficial soil amendments by composting the non-agricultural by-products but does not know the best recipe to use for a compost mix, the time and temperatures required to break down the material or recommended rate of land application .

After Situation:

A dairy farm has soil quality resource concerns and plans to improve their soil by utilizing non-agricultural waste materials available locally. The dairy is located near an oyster producer that needs to dispose of excess oyster shells. The calcium in oyster shells can be used to buffer the pH of their soils. The dairy has agreed to receive excess oyster shells which are blended with dairy manure solids and composted. The finished product is laboratory tested to determine the characteristics such as pH and nutrient content. The composted product is used both for dairy bedding and land applied as a soil amendment and nutrient source. Recordkeeping is done for the quantity of non-agricultural material received, ratio blended with manure solids, composting temperatures and times with the corresponding tested sample analysis. Records of the recycled non-agricultural by-products applied to the land is maintained as part of their dairy nutrient management plan.

Feature Measure: Cubic Foot

Scenario Unit: Cubic Feet

Scenario Typical Size: 400.0

Scenario Total Cost: $1,483.50

Scenario Cost/Unit: $3.71

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	12	$544.08
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	6	$667.26
Materials						
Test, Compost Analysis	307	Moisture, Total N, P, K. Includes materials and shipping only.	Each	$45.36	6	$272.16

Practice: 633 - Waste Recycling

Scenario: #3 - Import Non-Agricultural By-Products, Land Applied

Scenario Description:

A farm has resource concerns about the low soil organic matter content on several fields. The fields are located where a source of municipal green waste may be available. The green, municipal waste could contain material such as food waste, green yard waste and waste from local processing facilities. The farmer agrees to recieve waste materials in bulk two times a year, once in the spring and once in the fall. A blended sample of the waste is tested for nutrients and any potential chemicals of concern. It is then land applied in such a manner that soil organic matter is enhanced, crop nutrents are available and soil compaction is minimized. Records of the tested samples and rates of land application are maintained and accounted for in the nutrient management plan. Associated practices: 590-Nutrient Management, (Temporary Field) Waste Storage

Before Situation:

A farm has several fields with low soil organic matter and is located near a community where the local municipality collects green waste. The farmer is concerned about land applying the green waste directly to the fields and that the applied material may tie-up nutrients as well as possible soil compaction issues from equipment the municipality may use for spreading. The farmer wants to make sure the waste material that may be applied is safe and existing soil quality conditions are protected before agreeing to recycle any imported green waste.

After Situation:

A farm has low soil organic matter content on several fields and can import non-agricultural green waste material. The farm imports the green waste material that has been chopped and screened for land application. The imported material is briefly stock piled, for no more than 7 days while a blended sample is tested. The sample is tested for nutrient content and any potential chemcials of concern. Based on results of the tested sample and in consultation with an agronomist the waste material is land applied on the agricultural fields. Soil is protected from compaction by applying the waste in an appropiate manner. Records of the sample test and rate of land application in the field are maintained. The sampled test information is used to adjust fertilizer application rates and to prevent crop nutrient tie-up resulting from increased carbon in the soil. The green waste recycling activity on the farm is documented and included in the nutrient management plan records.

Feature Measure: Ton

Scenario Unit: Ton

Scenario Typical Size: 20.0

Scenario Total Cost: $484.10

Scenario Cost/Unit: $24.21

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	4	$181.36
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	2	$222.42
Materials						
Test, Manure Analysis	306	Moisture, Total N, P, K. Includes materials and shipping only.	Each	$40.16	2	$80.32

Practice: 634 - Waste Transfer

Scenario: #1 - Wastewater catch basin, less than 1000 gal.

Scenario Description:

Installation for a wastewater collection system that includes materials and structures to collect liquids of a design volume less than 1000 gallons such as silage leachate, lot runoff and other contaminated liquid effluent. This may include curbs, screens, precast manholes, sumps or catch basins. The wastewater will typically be transferred from the collection basin to a waste storage facility through a gravity or low pressure flow conduit. Associated practices may include: PS 313 Waste Storage Facility; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management; PS 633, Waste Recycling. This scenario addresses the potential for surface water and groundwater quality degradation from liquid wastewater running unchecked out of silage bunkers and off of animal feeding lots.

Before Situation:

Inadequate storage is available to collect wastewater from an operation that may contaminate surface or groundwater resources. The liquids contain few solids or limited solids that can be easily screened out without blocking the collection intake.

After Situation:

This practice scenario is suitable where the estimated design volume for wastewater transfer is less than 1000 gallons of contaminated liquid that may flow from silage bunkers or animal lot areas after a precipitation event. The practice scenario typically includes materials and installation of flat and formed concrete for curbs and/or gutters to collect liquids. With the installation of a precast manhole with lid or catch basin with grate. The cost includes excavation, placement of bedding as needed, placement of structure and backfill with construction of concrete inlet collection area. Transfer pump if needed must be contracted under pumping plant, PS 533.

Feature Measure: Collection volume installed

Scenario Unit: Gallons

Scenario Typical Size: 1,000.0

Scenario Total Cost: $8,567.21

Scenario Cost/Unit: $8.57

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$372.36	4	$1,489.44
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$494.40	2	$988.80
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$29.47	8	$235.76
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.89	4	$203.56
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$46.88	4	$187.52
Demolition, concrete	1498	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yards	$11.03	2	$22.06
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	24	$580.56
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	8	$211.68
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	8	$269.12
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	16	$725.44
Materials						
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic Yards	$22.79	5	$113.95
Catch Basin, concrete, 60 in dia.	1754	Precast 60-in diameter catch basin, 6 feet deep, with collar and grate cover. Materials only.	Each	$2,750.84	1	$2,750.84
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	2	$317.06

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 634 - Waste Transfer

Scenario: #2 - Wastewater reception pit, 1000 to 5000 gal.

Scenario Description:

Installation for a wastewater collection system that includes materials and structures to collect liquids of a design volume between 1000 and 5000 gallons such as silage leachate, lot runoff and other contaminated liquid effluent. This scenario includes a reinforced concrete manure reception pit for temporary storage and transfer of manure and wastewater for an animal operation. Reception Pit includes safety fence w/gate or solid/grated cover. The wastewater will typically be transferred from the collection basin to a waste storage facility through a gravity or low pressure flow conduit. Associated practices may include: PS 313 Waste Storage Facility; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management; PS 633, Waste Recycling. This scenario addresses the potential for surface water and groundwater quality degradation from liquid wastewater running unchecked out of silage bunkers and off of animal feeding lots.

Before Situation:

Inadequate storage is available to collect wastewater from an operation that may contaminate surface or groundwater resources.

After Situation:

This practice scenario is suitable where the estimated design volume for waste collection and transfer is between 1000 and 5000 gallons of liquid waste. The practice scenario typically includes materials and installation of flat and formed concrete for curbs and gutters to collect liquid slurry waste and the installation of an 8'x12'x6' reinforced concrete reception pit formed in place that includes safety fence w/gate or solid/grated cover. The cost includes excavation, placement of subgrade as needed, forming, pouring and finishing of concrete structure and backfilling. Transfer pump if needed must be contracted under pumping plant, PS 533.

Feature Measure: Collection volume installed

Scenario Unit: Gallons

Scenario Typical Size: 4,300.0

Scenario Total Cost: $15,714.89

Scenario Cost/Unit: $3.65

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$372.36	6	$2,234.16
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$494.40	14	$6,921.60
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$29.47	24	$707.28
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.89	8	$407.12
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$46.88	8	$375.04
Demolition, concrete	1498	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yards	$11.03	3	$33.09
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	64	$1,548.16
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	16	$423.36
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	24	$807.36
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	24	$1,088.16
Materials						
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic Yards	$22.79	12	$273.48
Safety chain tractor barrier	1725	3/8 in. Transport chain barrier installed to prevent tractor equipment from entering wastewater collection basin or pit. Material cost only.	Feet	$2.69	40	$107.60
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	2	$317.06

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 634 - Waste Transfer

Scenario: #3 - Wastewater basin, 5000 gal. and larger

Scenario Description:

Installation for a wastewater collection system that includes materials and structures to collect liquids of a design volume greater than 5000 gallons such as lot runoff, manure slurry and other contaminated liquid effluent. The wastewater collected in this pit is intended to be transferred to final storage within a 48 hour period. This scenario includes a reinforced concrete manure reception pit for temporary storage and transfer of manure and wastewater for an animal operation. Reception Pit includes safety fence w/gate or solid/grated cover. The wastewater will typically be transferred from the collection basin to a waste storage facility through a gravity or low pressure flow conduit. Associated practices may include: PS 313 Waste Storage Facility; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management; PS 633, Waste Recycling. This scenario addresses the potential for surface water and groundwater quality degradation from liquid wastewater running unchecked out of silage bunkers and off of animal feeding lots.

Before Situation:

Inadequate storage is available to collect wastewater from an operation that may contaminate surface or groundwater resources.

After Situation:

This practice scenario is suitable where the estimated maximum design volume for wastewater collected is greater than 5000 gallons of liquid waste within 48 hours or before it is stored or treated. The practice scenario typically includes materials and installation of flat and formed concrete for curbs and gutters inlet area to collect liquid slurry waste and the installation of an 12 ft wide x 16 ft long x 6 ft deep reinforced concrete reception pit formed in place that includes safety fence w/gate or solid/grated cover. The cost includes excavation, placement of subgrade as needed, forming, pouring and finishing of concrete structure and backfilling. Transfer pump if needed must be contracted under pumping plant, PS 533.

Feature Measure: Collection volume installed

Scenario Unit: Gallons

Scenario Typical Size: 8,600.0

Scenario Total Cost: $24,178.57

Scenario Cost/Unit: $2.81

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$372.36	11	$4,095.96
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$494.40	22	$10,876.80
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$29.47	32	$943.04
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.89	12	$610.68
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$46.88	16	$750.08
Demolition, concrete	1498	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yards	$11.03	4	$44.12
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	80	$1,935.20
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	28	$740.88
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	32	$1,076.48
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	40	$1,813.60
Materials						
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic Yards	$22.79	15	$341.85
Safety chain tractor barrier	1725	3/8 in. Transport chain barrier installed to prevent tractor equipment from entering wastewater collection basin or pit. Material cost only.	Feet	$2.69	60	$161.40
Mobilization						

Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	2	$317.06
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 634 - Waste Transfer

Scenario: #4 - Medium sized wastewater reception pit with 6 inch conduit transfer pipe to waste storage pond

Scenario Description:

Installation for a wastewater collection system that includes materials and structures to collect a design volume between 1000 and 5000 gallons of liquids such as silage leachate, lot runoff and other contaminated liquid effluent which is then transferred through a 6" low pressure conduit to the waste storage structure. This scenario includes a reinforced concrete manure reception pit and a 6" PVC SDR 41 conduit to transfer the manure and wastewater to a waste storage pond. Reception Pit includes safety fence w/gate or solid/grated cover. The transfer conduit consists of the pipe plus the inlet structure connection and all other fittings, trench excavation and backfill, labor and equipment for installation. If pumping is required for the pipe flow velocity that needs to be contracted under PS 533, Pumping Plant Associated practices may include: PS 313 Waste Storage Facility; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management; PS 633, Waste Recycling. This scenario addresses the potential for surface water and groundwater quality degradation from liquid wastewater running unchecked out of silage bunkers and off of animal feeding lots.

Before Situation:

Inadequate storage is available to collect wastewater from an operation that may contaminate surface or groundwater resources. The transfer of waste water to a waste storage facility is required for the CNMP.

After Situation:

This practice scenario is for the estimated design volume for waste collection and transfer of 4300 gallons of liquid waste and can be transferred under gravity or low pressure flow in a 6" PVC pipeline to a waste storage pond. The practice scenario typically includes materials and installation of flat and formed concrete for curbs and gutters at the basin to collect liquid slurry waste and the installation of an 8'x12'x6' reinforced concrete reception pit formed in place that includes safety fence w/gate or solid/grated cover. The transfer pipeline is assumed to be 300 feet long, 6" PVC gasketted SDR 41 pipe with an adapter for the concrete basin, couplers, air-vac vents, all other fittings placed as specified by the design, trench excavation, pipe bedding and backfill. Pipe length for contract is increased by 10% to account for required fittings. The cost includes excavation, placement of subgrade as needed, forming, pouring and finishing of concrete structure and backfilling as well as pipeline installation. Transfer pump if needed must be contracted under pumping plant, PS 533.

Feature Measure: Collection volume installed

Scenario Unit: Gallons

Scenario Typical Size: 4,300.0

Scenario Total Cost: $19,363.73

Scenario Cost/Unit: $4.50

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$372.36	6	$2,234.16
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$494.40	14	$6,921.60
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$29.47	32	$943.04
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.89	8	$407.12
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$46.88	16	$750.08
Demolition, concrete	1498	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yards	$11.03	3	$33.09
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	96	$2,322.24
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	24	$635.04
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	32	$1,076.48
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	32	$1,450.88
Materials						
Pipe, PVC, 6 in., SDR 41	984	Materials: - 6 inch - PVC - SDR 41 100 psi - ASTM D2241	Feet	$3.89	330	$1,283.70

Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic Yards	$22.79	18	$410.22
Safety chain tractor barrier	1725	3/8 in. Transport chain barrier installed to prevent tractor equipment from entering wastewater collection basin or pit. Material cost only.	Feet	$2.69	40	$107.60
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	2	$317.06
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 634 - Waste Transfer

Scenario: #5 - Large reception pit, 8 inch pipe to treatment, plus 6 inch pipe to storage.

Scenario Description:

Installation for a wastewater collection system that includes materials and structures to collect liquids such as lot runoff, manure slurry and other contaminated liquid effluent. The wastewater collected in this 8600 gallon pit is intended to be transferred to final storage within a 48 hour period. The waste is transferred through an 8" conduit to a waste treatment location. After treatment the remaining liquids are transferred to the waste storage pond in a 6" pipeline. This scenario includes a reinforced concrete manure reception pit an 8" conduit to transfer the manure and wastewater to a treatment location and a secondary 6" transfer pipeline. Reception Pit includes safety fence w/gate or solid/grated cover. The 8" transfer conduit and 6" transfer pipeline consists of the pipe plus the inlet structures connections and all other fittings, trench excavation and backfill, labor and equipment for installation. If pumping is required for the pipe flow velocity that needs to be contracted under PS 533, Pumping Plant Associated practices may include: PS 313 Waste Storage Facility; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management; PS 633, Waste Recycling. This scenario addresses the potential for surface water and groundwater quality degradation from liquid wastewater running unchecked out of silage bunkers and off of animal feeding lots.

Before Situation:

Inadequate storage is available to collect wastewater from an operation that may contaminate surface or groundwater resources. The transfer of waste water to a waste storage facility is required for the CNMP. Additional waste treatment is required for the waste stream prior to reaching in the waste storage pond.

After Situation:

This practice scenario is suitable where the estimated design volume for waste collection and transfer is greater than 5000 gallons of liquid waste and can be transferred under gravity or low pressure flow in an 8" conduit to a waste treatment site. Then the remaining liquids will be transferred in a 6" pipeline to a waste storage pond. The practice scenario typically includes materials and installation of flat and formed concrete for curbs and gutters to collect liquid slurry waste and the installation of an 8'x12'x6' reinforced concrete reception pit formed in place that includes safety fence w/gate or solid/grated cover. The first stage transfer pipeline is assumed to be 200 feet long, 8" PVC gasketted SDR 41 pipe with an adapter for the concrete basin, couplers, air-vac vents, all other fittings placed as specified by the design. The second stage transfer pipe is assumed to be 500 feet long 6" PVC gasketted SDR 41 pipe with an adapter for the wastewater treatment system, couplers, air-vac vents, all other fittings placed as specified by the design.. Pipe length for contract is increased by 10% to account for required fittings. The cost includes excavation, placement of subgrade as needed, forming, pouring and finishing of concrete structure and backfilling as well as pipeline installation costs for trench excavation, pipe bedding and backfill. Transfer pump if needed must be contracted under pumping plant, PS 533.

Feature Measure: Collection volume installed

Scenario Unit: Gallons

Scenario Typical Size: 8,600.0

Scenario Total Cost: $31,356.69

Scenario Cost/Unit: $3.65

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$372.36	11	$4,095.96
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$494.40	22	$10,876.80
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$29.47	40	$1,178.80
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.89	12	$610.68
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$46.88	24	$1,125.12
Demolition, concrete	1498	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yards	$11.03	4	$44.12
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	140	$3,386.60
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	36	$952.56
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	40	$1,345.60
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	40	$1,813.60
Materials						

Pipe, PVC, 6 in., SDR 41	984	Materials: - 6 inch - PVC - SDR 41 100 psi - ASTM D2241	Feet	$3.89	220	$855.80
Pipe, PVC, 8 in., SDR 41	985	Materials: - 8 inch - PVC - SDR 41 100 psi - ASTM D2241	Feet	$6.54	550	$3,597.00
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic Yards	$22.79	23	$524.17
Safety chain tractor barrier	1725	3/8 in. Transport chain barrier installed to prevent tractor equipment from entering wastewater collection basin or pit. Material cost only.	Feet	$2.69	60	$161.40
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	2	$317.06
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 634 - Waste Transfer

Scenario: #6 - Concrete Channel

Scenario Description:

Installation of a concrete channel that consists of a slab with curb and footing on each side of the slab for the entire length of the channel to enable the facility manager to direct liquid waste to an existing collection basin and/or waste storage facility. Water quality concerns will be addressed by preventing liquid waste from entering surface waters, and to facilitate timely land application of manure and wastewater at agronomic rates according to the CNMP. This scenario addresses the potential for surface water and groundwater quality degradation. Associated practices may include: PS 313 Waste Storage Facility; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management; PS 633, Waste Recycling.

Before Situation:

Current facility operations are allowing liquid waste to flow uncontrolled during periods of precipitation events or cleaning operations such that water resources can be contaminated.

After Situation:

Typical installation of a 12 foot wide 100' long concrete channel that consists of a 5" thick concrete slab with curbing on each side of the slab that is 2' high, 6" thick with footing for the entire length. The purpose is to transfer liquids or manure slurry from one area to an existing collection basin or waste storage facility. Includes safety chain for equipment. Alternative configurations can consist of the installation of a more narrow or wider channel that may or may not have curbs or a deeper shaped channel and may include a half pipe on the bottom.

Feature Measure: Bottom surface area of concrete ch

Scenario Unit: Square Feet

Scenario Typical Size: 1,200.0

Scenario Total Cost: $19,463.72

Scenario Cost/Unit: $16.22

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$372.36	22	$8,191.92
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$494.40	11	$5,438.40
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.89	8	$407.12
Demolition, concrete	1498	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yards	$11.03	4	$44.12
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	64	$1,548.16
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	8	$269.12
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	50	$2,267.00
Materials						
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic Yards	$22.79	26	$592.54
Safety gate, span manure transfer channel or chute	1952	Safety gate to span manure transfer channel at push off wall or chute outlet. Minimum of 4' tall with openings that will not pass a 6 inch or larger sphere. Includes materials only.	Feet	$14.62	16	$233.92
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 634 - Waste Transfer

Scenario: #7 - Concrete Channel, push-off wall at pond and safety gate

Scenario Description:

Installation of a concrete channel that consists of a slab with curb and footing on each side of the slab for the entire length of the channel to enable the facility manager to direct liquid waste to a collection basin and/or waste storage facility at the end of a push-off ramp. A safety gate is installed at the end of the push-off ramp. Water quality concerns will be addressed by preventing liquid waste from entering surface waters, and to facilitate timely land application of manure and wastewater at agronomic rates according to the CNMP. This scenario addresses the potential for surface water and groundwater quality degradation. Associated practices may include: PS 313 Waste Storage Facility; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management; PS 633, Waste Recycling.

Before Situation:

Current facility operations are allowing liquid waste to flow uncontrolled during periods of precipitation events or cleaning operations such that water resources can be contaminated.

After Situation:

Typical installation of a 12 foot wide 100' long concrete channel that consists of a 5" thick concrete slab with curbing on each side of the slab that is 2' high, 6" thick with footing for the entire length. The push-off ramp is a concrete cantilever structure that allows the waste to be moved into the storage facility. The purpose is to transfer liquids or manure slurry from one area to a collection basin or waste storage facility. Includes safety gate for human and animal exclusion. Alternative configurations can consist of the installation of a more narrow or wider channel that may or may not have curbs or a deeper shaped channel and may include a half pipe on the bottom.

Feature Measure: Bottom surface area of concrete ch

Scenario Unit: Square Feet

Scenario Typical Size: 1,200.0

Scenario Total Cost: $23,263.61

Scenario Cost/Unit: $19.39

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$372.36	22	$8,191.92
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$494.40	17	$8,404.80
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.89	8	$407.12
Demolition, concrete	1498	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yards	$11.03	5	$55.15
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	98	$2,370.62
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	8	$269.12
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	50	$2,267.00
Materials						
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic Yards	$22.79	26	$592.54
Safety gate, span manure transfer channel or chute	1952	Safety gate to span manure transfer channel at push off wall or chute outlet. Minimum of 4' tall with openings that will not pass a 6 inch or larger sphere. Includes materials only.	Feet	$14.62	16	$233.92
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 634 - Waste Transfer

Scenario: #8 - Concrete channel, to medium sized wastewater reception pit

Scenario Description:

Installation of a concrete channel that consists of a slab with curb and footing on each side of the slab for the entire length of the channel to enable the facility manager to direct liquid waste to a 4300 gallon wastewater collection basin and/or waste storage facility. Water quality concerns will be addressed by preventing liquid waste from entering surface waters, and to facilitate timely land application of manure and wastewater at agronomic rates according to the CNMP. This scenario addresses the potential for surface water and groundwater quality degradation. Associated practices may include: PS 313 Waste Storage Facility; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management; PS 633, Waste Recycling.

Before Situation:

Current facility operations are allowing liquid waste to flow uncontrolled during periods of precipitation events or cleaning operations such that water resources can be contaminated.

After Situation:

Typical installation of a 12 foot wide 100' long concrete channel that consists of a 5" thick concrete slab with curbing on each side of the slab that is 2' high, 6" thick with footing for the entire length. The purpose is to transfer liquids or manure slurry from one area to a 8'x12'x6' collection basin or waste storage facility. Includes safety chain around the basin for equipment. Alternative configurations can consist of the installation of a more narrow or wider channel that may or may not have curbs or a deeper shaped channel and may include a half pipe on the bottom.

Feature Measure: Bottom surface area of concrete ch

Scenario Unit: Square Feet

Scenario Typical Size: 1,200.0

Scenario Total Cost: $29,395.98

Scenario Cost/Unit: $24.50

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$372.36	22	$8,191.92
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$494.40	23	$11,371.20
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$29.47	24	$707.28
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.89	8	$407.12
Demolition, concrete	1498	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yards	$11.03	4	$44.12
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	120	$2,902.80
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	8	$211.68
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	24	$807.36
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	60	$2,720.40
Materials						
Pipe, Steel, 3 in., SCH 40	1003	Materials: - 3 inch - Steel SCH 40	Feet	$15.70	30	$471.00
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic Yards	$22.79	28	$638.12
Safety chain tractor barrier	1725	3/8 in. Transport chain barrier installed to prevent tractor equipment from entering wastewater collection basin or pit. Material cost only.	Feet	$2.69	50	$134.50
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	2	$317.06

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 634 - Waste Transfer

Scenario: #9 - Concrete channel, to medium reception pit, 6 inch pipe to storage.

Scenario Description:

Installation of a concrete channel that consists of a slab with curb and footing on each side of the slab for the entire length of the channel to enable the facility manager to direct liquid waste to a 4300 gallon collection basin and/or waste storage facility. The wastewater is then transferred from the basin to the waste storage pond through a 6" diameter low pressure pipeline. Water quality concerns will be addressed by preventing liquid waste from entering surface waters, and to facilitate timely land application of manure and wastewater at agronomic rates according to the CNMP. This scenario addresses the potential for surface water and groundwater quality degradation. Associated practices may include: PS 313 Waste Storage Facility; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management; PS 633, Waste Recycling.

Before Situation:

Current facility operations are allowing liquid waste to flow uncontrolled during periods of precipitation events or cleaning operations such that water resources can be contaminated. Waste transfer structures are needed to transfer wastes to a waste storage pond

After Situation:

Typical installation of a 12 foot wide 100' long concrete channel that consists of a 5" thick concrete slab with curbing on each side of the slab that is 2' high, 6" thick with footing for the entire length. The waste transfer scenario is to scrape liquids or manure slurry from the waste production area down the channel to a 8'x12'x6' collection basin. From the basin it is then transferred through a 6" pipe 500 feet to the waste storage pond. The scenario also includes a safety chain around the basin. The transfer pipe is a 6" diameter gasketted PVC SDR 41 low pressure pipeline. Pipe length for contract is increased by 10% to account for required fittings. The cost includes excavation, placement of subgrade as needed, forming, pouring and finishing of concrete structure and backfilling as well as pipeline installation costs for trench excavation, pipe bedding and backfill. Transfer pump if needed must be contracted under pumping plant, PS 533. Alternative configurations can consist of the installation of a more narrow or wider channel that may or may not have curbs or a deeper shaped channel and may include a half pipe on the bottom.

Feature Measure: Bottom surface area of concrete ch

Scenario Unit: Square Feet

Scenario Typical Size: 1,200.0

Scenario Total Cost: $33,794.18

Scenario Cost/Unit: $28.16

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$372.36	22	$8,191.92
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$494.40	23	$11,371.20
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$5.40	45	$243.00
Trenching, Earth, loam, 24 in. x 48 in.	54	Trenching, earth, loam, 24 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling	Feet	$2.58	500	$1,290.00
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$29.47	24	$707.28
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.89	8	$407.12
Demolition, concrete	1498	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yards	$11.03	4	$44.12
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	150	$3,628.50
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	8	$211.68
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	24	$807.36
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	60	$2,720.40
Materials						
Pipe, PVC, 6 in., SDR 41	984	Materials: - 6 inch - PVC - SDR 41 100 psi - ASTM D2241	Feet	$3.89	550	$2,139.50
Pipe, Steel, 3 in., SCH 40	1003	Materials: - 3 inch - Steel SCH 40	Feet	$15.70	30	$471.00

Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic Yards	$22.79	28	$638.12
Safety chain tractor barrier	1725	3/8 in. Transport chain barrier installed to prevent tractor equipment from entering wastewater collection basin or pit. Material cost only.	Feet	$2.69	50	$134.50
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	2	$317.06
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 634 - Waste Transfer

Scenario: #10 - Small Flush System, less than 1000 gallon per flush to reception pit, 8 inch pipe to storage.

Scenario Description:

Installation of a manure and wastewater collection system that includes materials and structures to flush waste from a concrete surface into a collection basin and transferred to a waste storage pond. This small flush system must have an adequate source for the flush water and will use an 8" diameter pipe. The system may include flush water tank, piping and valves, concrete flush lane, concrete curbs or gutter, precast manholes, sumps or catch basins. The animal waste will be transferred by a flush cyle released from the flush tank to rinse the concrete surface and carry the waste to a collection basin, into a pipe and to a waste storage pond. Associated practices may include: PS 313 Waste Storage Facility; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management; PS 633, Waste Recycling. This scenario addresses the potential for surface water and groundwater quality degradation from animal waste.

Before Situation:

A small animal production facility does not have an efficient method for collecting and transferring the animal waste produced. A source of sufficient water or wastewater resources are available to design a flush system to clean the production floor and collect the waste materials deposited.

After Situation:

This practice scenario is suitable only where the water or wastewater supplies are available for operating a flush system to collect the animal waste deposited on the concrete surfaces. The design flush volume for a small wastewater flush system is less than 1000 gallons and requires no more than 50 feet of an 8 inch diameter pressure pipe for the flush pipe. The scenario includes materials and installation of a flush tank, piping and valves to manage the flush flow, concrete flush lane, concrete curbs or gutters to transfer the flow to a collection basin. The liquids then flow from the basin to the waste storage pond, an estimated length of 200 feet and requires an 8 inch diameter low pressure pipeline with an open outlet to the waste storage pond. The cost includes excavation, placement of bedding aggregate as needed, forming and placement of structures, conveyance pipeline with valves and structural backfill. Pump must be contracted under pumping plant, PS 533.

Feature Measure: 1000 Gallons of flush water

Scenario Unit: Gallons

Scenario Typical Size: 1,000.0

Scenario Total Cost: $16,460.22

Scenario Cost/Unit: $16.46

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$372.36	7	$2,606.52
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$494.40	3	$1,483.20
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$29.47	20	$589.40
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.89	4	$203.56
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$46.88	4	$187.52
Demolition, concrete	1498	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yards	$11.03	4	$44.12
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	60	$1,451.40
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	8	$211.68
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	20	$672.80
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	30	$1,360.20
Materials						
Pipe, PVC, 8 in., SDR 21	988	Materials: - 8 inch - PVC - SDR 21 200 psi - ASTM D2241	Feet	$15.27	55	$839.85
Pipe, PVC, 8 in., SDR 35	994	Materials: - 8 inch - PVC - SDR 35 - ASTM D3034	Feet	$9.54	220	$2,098.80
Tank, Poly enclosed Storage, 300-1000 gal	1074	Water storage tanks. Includes materials and shipping only.	Gallons	$0.83	1000	$830.00

Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic Yards	$22.79	15	$341.85
Catch Basin, concrete, 60 in dia.	1754	Precast 60-in diameter catch basin, 6 feet deep, with collar and grate cover. Materials only.	Each	$2,750.84	1	$2,750.84
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	2	$317.06
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 634 - Waste Transfer

Scenario: #11 - Wastewater Flush Transfer System, Pipes only, 12 inch diameter

Scenario Description:

Installation of the pipe for a manure and wastewater flush system that provides the structures to utilize recycled wastewater to flush waste from a concrete surface into a waste storage pond. This may include pipe and valves, concrete flush lane, concrete curbs or gutter. The animal waste will be transferred by recycled flush water through the pipe system to rinse the concrete production surface and carry the waste to a waste storage pond. Associated practices may include: PS 313 Waste Storage Facility; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management; PS 633, Waste Recycling. This scenario addresses the potential for surface water and groundwater quality degradation from animal waste.

Before Situation:

An animal production facility does not have an efficient method for collecting and transferring the animal waste produced. Wastewater however is available in a sufficient quantity to provide a flush cycle to clean the production floor and collect the waste materials deposited.

After Situation:

This practice scenario is suitable where wastewater can be recycled for a flush system. Supplemental piping is needed to install the recycled flush water as a means to collect the animal waste deposited on the concrete production surfaces. The pipe design for the flush volume requires100 feet of 12 inch diameter pipe for pressure flow. The flushed wastes are then piped from an existing collection basin to the waste storage pond an estimated length of 200 feet through a 12 inch diameter low pressure pipe with an open outlet at the pond. The cost includes excavation, placement of bedding as needed, flush and conveyance pipelines with valves and pipe backfill. Pumps must be contracted under pumping plant, PS 533.

Feature Measure: Flush - pipes

Scenario Unit: Feet

Scenario Typical Size: 300.0

Scenario Total Cost: $18,722.14

Scenario Cost/Unit: $62.41

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$372.36	8	$2,978.88
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$5.40	66	$356.40
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$29.47	30	$884.10
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$46.88	8	$375.04
Demolition, concrete	1498	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yards	$11.03	4	$44.12
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	70	$1,693.30
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	8	$211.68
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	30	$1,009.20
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	35	$1,586.90
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic Yards	$28.74	10	$287.40
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic Yards	$22.79	6	$136.74
Pipe, PVC, 12 in., SDR 35	1252	Pipe, PVC, SDR 35, 12 inch Diameter - ASTM D3034. Material cost only.	Feet	$21.37	220	$4,701.40
Pipe, PVC, 12 in., SDR 21	1717	Materials: - 12 inch - PVC - SDR 21 - ASTM D2241	Feet	$33.35	110	$3,668.50
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	2	$317.06

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 634 - Waste Transfer

Scenario: #12 - Hopper gravity inlet, 24 inch diameter HDPE pipeline, to waste storage facility

Scenario Description:

Gravity flow conduit is typically a large diameter water tight HDPE sanitary sewer pipe used to transfer manure by gravity from one location to another. The gravity transfer system typically consists of an inlet structure or hopper with an adaptor to a smooth interior large diameter HDPE pipe. The pipe conveys the slurry waste liquid between the waste collection point and a manure storage or waste treatment structure. Adequate head on the pipe flow or change in elevation must be available for the gravity system to function and should be evaluated by the design engineer. This practice includes the inlet structure, transfer pipe plus an and all other fittings, trench excavation and backfill, labor and equipment for installation. This conduit is part of a manure transfer system for a planned waste management or comprehensive nutrient management plan. This scenario addresses the transport of liquid waste to a waste storage or treatment facility to prevent a water quality resource concern of excessive nutrients/organics and harmful levels of pathogens in surface water and/or excessive nutrients/organics in ground water. Associated practices may include: PS 313 Waste Storage Facility; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management; PS 633, Waste Recycling.

Before Situation:

An area of waste production is separated from the waste storage facility and current operations may cause water quality concerns as it is not efficient in transporting the waste to the storage. The site has a change in elevation between production area and treatment or storage structure that is adequate to provide sufficient head for a gravity flow conduit to transport the slurry waste liquid stream.

After Situation:

Install an 80 foot long gravity transfer system of a precast collection hopper with an adaptor to a water tight smooth interior 24"diameter HDPE sanitary sewer grade pipe that will flow to an outlet at the site of manure treatment or storage. This scenario includes the collection hopper, pipe, inlet, outlet, couplers and all other fittings, trench excavation, pipe bedding and backfill. The site should be evaluated by the designing engineer to make sure there is adequate elevation drop before contracting. The transfer conduit will provide collection and containment of the manure slurry, thereby protecting water quality resources.

Feature Measure: Length of pipe installed

Scenario Unit: Feet

Scenario Typical Size: 80.0

Scenario Total Cost: $12,267.55

Scenario Cost/Unit: $153.34

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$372.36	7	$2,606.52
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	61	$126.88
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$5.40	33	$178.20
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.42	15	$51.30
Hydraulic Excavator, .5 CY	930	Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included.	Hours	$57.32	16	$917.12
Demolition, concrete	1498	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yards	$11.03	4	$44.12
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	36	$870.84
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	16	$538.24
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	16	$725.44
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic Yards	$28.74	7	$201.18
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic Yards	$22.79	7	$159.53
Pipe, HDPE, CPT, Double Wall, Soil Tight, 24 in.	1246	Pipe, Corrugated HDPE Double Wall, 24 inch diameter with soil tight joints - AASHTO M294. Material cost only.	Feet	$29.84	88	$2,625.92
Catch Basin, concrete, 60 in dia.	1754	Precast 60-in diameter catch basin, 6 feet deep, with collar and grate cover. Materials only.	Each	$2,750.84	1	$2,750.84

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 634 - Waste Transfer

Scenario: #13 - 30 inch HDPE conduit, gravity flow, from existing inlet structure

Scenario Description:

Gravity flow conduit is typically a large diameter water tight HDPE sanitary sewer pipe used to transfer manure by gravity from one location to another. The gravity transfer system typically consists of an existing inlet structure or hopper with attachment to a smooth interior large diameter pipe. The pipe conveys the slurry waste liquid between the waste collection point and a manure storage or waste treatment structure. Adequate head on the pipe flow or change in elevation must be available for the gravity system to function and should be evaluated by the design engineer. This practice includes the pipe attachment to an existing inlet structure and all other fittings, trench excavation and backfill, labor and a equipment for installation. This conduit is part of a manure transfer system for a planned waste management or comprehensive nutrient management plan. This scenario addresses the transport of liquid waste to a waste storage or treatment facility to prevent a water quality resource concern of excessive nutrients/organics and harmful levels of pathogens in surface water and/or excessive nutrients/organics in ground water. Associated practices may include: PS 313 Waste Storage Facility; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management; PS 633, Waste Recycling.

Before Situation:

An area of waste production is separated from the waste storage facility and current operations may cause water quality concerns as it is not efficient in transporting the waste to the storage. The site has a change in elevation between production area and treatment or storage structure that is adequate to provide sufficient head for a gravity flow conduit to transport the slurry waste liquid stream.

After Situation:

Install a 150 foot long 30" diameter water tight HDPE pipe to transfer manure by gravity from one location to another. A gravity transfer system typically consists of a sealed inlet at an existing waste collection structure to a smooth interior 30" sewer grade pipe that will gravity flow to an outlet at a site of manure treatment or storage. This scenario includes the pipe, inlet, outlet, couplers and all other fittings, trench excavation, pipe bedding and backfill. The site should be evaluated by the designing engineer to make sure there is adequate elevation drop before contracting. If required an inlet structure may be contracted under another scenario. The transfer conduit will provide collection and containment of the manure slurry, thereby protecting water quality resources.

Feature Measure: Length of pipe installed

Scenario Unit: Feet

Scenario Typical Size: 150.0

Scenario Total Cost: $17,713.56

Scenario Cost/Unit: $118.09

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$372.36	14	$5,213.04
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	125	$260.00
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$5.40	57	$307.80
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.42	45	$153.90
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$29.47	30	$884.10
Demolition, concrete	1498	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yards	$11.03	7	$77.21
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	48	$1,161.12
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	30	$1,009.20
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	20	$906.80
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic Yards	$28.74	13	$373.62
Pipe, HDPE, CPT, Double Wall, Soil Tight, 30 in.	1247	Pipe, Corrugated HDPE Double Wall, 30 inch diameter with soil tight joints - AASHTO M294. Material cost only.	Feet	$41.79	165	$6,895.35
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 634 - Waste Transfer

Scenario: #14 - 12 inch diameter, Low pressure flow, PVC conduit

Scenario Description:

Low pressure flow conduit is typically a PVC pipeline used to transfer wastewater or manure slurry by pumping from one production location to a storage or treatment location. Low pressure flow PVC transfer pipelines can be between 3" and 30" diameter and are designed for a pumping pressure of no more than 100 psi. The low pressure transfer system typically consists of an inlet structure or hopper connected to a smooth interior PVC pipe sized to deliver the design flow. This practice includes the pipe plus the inlet structure connection and all other fittings, trench excavation and backfill, labor and a equipment for installation. This conduit is part of a manure transfer system for a planned waste management or comprehensive nutrient management plan. This scenario addresses the transport of liquid waste to a waste storage or treatment to prevent a water quality resource concern of excessive nutrients/organics and harmful levels of pathogens in surface water and/or excessive nutrients/organics in ground water. Associated practices may include: PS 313 Waste Storage Facility; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management; PS 633, Waste Recycling.

Before Situation:

An area of waste production is separated from the waste storage facility and current operations may cause water quality concerns. The site of waste collection or structure has the capacity to install a pumping plant but needs a pipeline to transfer the liquid manure slurry under low pressure from the collection site to the treatment or storage structure.

After Situation:

Install a 300 foot long 12 inch diameter low pressure wastewater pipeline to transfer wastewater or manure slurry from one location to another. The low pressure flow situation refers to pipeflow that has an unrestricted outlet and low pumping head pressure. A pumping plant will send the liquid through a pipe inlet at an existing waste collection basin into a 12 inch diameter pipeline to transfer the design volume to an outlet at the wastewater treatment or storage site. This scenario includes the pipe, inlet connection, outlet, couplers and all other fittings, trench excavation, pipe bedding and backfill. The site should be evaluated by the designing engineer before contracting. If required a pumping plant may be contracted under PS 533, Pumping Plant to support this system. The low pressure transfer conduit will provide collection, transfer and containment of the manure slurry, thereby protecting water quality resources.

Feature Measure: Length of pipe installed

Scenario Unit: Feet

Scenario Typical Size: 300.0

Scenario Total Cost: $16,480.13

Scenario Cost/Unit: $54.93

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$372.36	14	$5,213.04
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	97	$201.76
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$5.40	56	$302.40
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.42	33	$112.86
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$29.47	32	$943.04
Demolition, concrete	1498	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yards	$11.03	7	$77.21
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	64	$1,548.16
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	32	$1,076.48
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic Yards	$28.74	14	$402.36
Pipe, PVC, 12 in., SCH 40	1716	Materials: 12 inch dia. PVC SCH 40, ASTM D1785	Feet	$18.58	330	$6,131.40
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 634 - Waste Transfer

Scenario: #15 - 10 inch diameter, Low pressure flow PVC pipeline, from waste storage pond to land application site.

Scenario Description:

Low pressure flow pipeline used to transfer manure wastewater by a low pressure pump from the waste storage pond to the field where it is applied according to the CNMP. The pipeline moves the water from the pond through a buried mainline with low pressure outlets that spread the water on a vegetated treatment area or to a site where the water is applied through an existing field application system. Low pressure flow PVC transfer pipelines can be between 3" and 30" diameter and are designed for a pumping pressure of 100 psi or less. This practice includes the pipe plus an inlet riser structure, clean-out risers and outlet risers plus all other valves and fittings, trench excavation and backfill, labor and a equipment for installation. Appurtenances include: couplings, fittings, air vents, pressure relief valves, thrust blocks, risers, and inline valves, and are included in the cost of pipe material (additional 10% of pipe material quantity). Cost of appurtenances does not include flow meters or backflow preventers. Typical installation applies to soils with no special bedding requirements. This pipeline is part of a manure transfer system for a planned waste management or comprehensive nutrient management plan. This scenario addresses the transport of liquid waste to a waste storage or treatment facility to prevent a water quality resource concern of excessive nutrients/organics and harmful levels of pathogens in surface water and/or excessive nutrients/organics in ground water. Associated practices may include: PS 313 Waste Storage Facility; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management; PS 633, Waste Recycling; PS 635, Vegetated Treatment Area.

Before Situation:

The waste storage structure is separated from the application fields where wastewater nutrients are needed. Soil nutrients in the near fields have high phosphorus levels from over application near the waste storage facility. The current application operation is high in the use of time and energy and may cause water quality concerns as it is not efficient in transporting the waste to the field.

After Situation:

Install a 1000 foot long 10 inch diameter PVC gasketted IPS pipe that has an SDR of 41 and is water tight under low pressure flow to transfer the manure wastewater. An inlet riser and is located near the pump site of the waste storage pond and designed for the desired pumping pressure and flow volume for the application system. This scenario includes the pipe, inlet riser, couplers, air-vac vents, all other fittings, and risers placed as specified by the design, trench excavation, pipe bedding and backfill. The site should be evaluated by the designing engineer to make sure the design will function. The transfer pipeline will deliver the manure slurry to the fields for agronomic nutrient utilization according to the CNMP, thereby protecting water quality resources.

Feature Measure: Length of pipe installed

Scenario Unit: Feet

Scenario Typical Size: 1,000.0

Scenario Total Cost: $32,592.22

Scenario Cost/Unit: $32.59

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formless, non reinforced	36	Non reinforced concrete cast-in-placed without forms by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$184.90	1	$184.90
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$5.40	127	$685.80
Trenching, Earth, loam, 24 in. x 48 in.	54	Trenching, earth, loam, 24 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling	Feet	$2.58	1000	$2,580.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	70	$1,693.30
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	20	$906.80
Materials						
Pipe, PVC, 10 in., SDR 21	1714	Materials: - 10 inch - PVC - SDR 21 - ASTM D2241	Feet	$23.70	1100	$26,070.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 634 - Waste Transfer

Scenario: #16 - 6 inch diameter, Pressure flow PVC pipeline, from waste storage pond to land application site.

Scenario Description:

Pressure flow pipeline used to transfer manure wastewater by pumping from the waste storage pond to the field where it is to be applied according to the CNMP. Pressure flow transfer pipelines can be between 3" and 12" diameter but 6" diameter is a commonly used pipe size. Pressure pipe will handle an internal pumping pressure between 130 and 200 psi depending on the designed pumping system and must have gasketted joints to seal for the wastewater transfer. The pressure pipe moves the water by pumping from the intake riser location, through a buried mainline with outlet risers spaced at 300 ft intervals for a traveler applicator. This practice includes the pipe plus an inlet riser structure, clean-out risers and outlet risers plus all other valves and fittings, trench excavation and backfill, labor and a equipment for installation. Appurtenances include: couplings, fittings, air vents, pressure relief valves, thrust blocks, risers, and inline valves, and are included in the cost of pipe material (additional 10% of pipe material quantity). Cost of appurtenances does not include flow meters or backflow preventers. Typical installation applies to soils with no special bedding requirements. This pipeline is part of a manure transfer system for a planned waste management or comprehensive nutrient management plan. This scenario addresses the transport of liquid waste to a waste storage or treatment facility to prevent a water quality resource concern of excessive nutrients/organics and harmful levels of pathogens in surface water and/or excessive nutrients/organics in ground water. Associated practices may include: PS 313 Waste Storage Facility; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management; PS 633, Waste Recycling; PS 635, Vegetated Treatment Area.

Before Situation:

The waste storage structure is separated from the application fields where wastewater nutrients are needed. Soil nutrients in the near fields have high phosphorus levels from over application near the waste storage facility. The current application operation is high in the use of time and energy and may cause water quality concerns as it is not efficient in transporting the waste to the field.

After Situation:

Install a 1000 foot long 6 inch diameter PVC gasketted IPS pipe that has an SDR of 21 and is water tight under pressure flow to transfer the manure wastewater. An inlet riser and is located near the pump site of the waste storage pond and designed for the desired pressure and flow for the application system. This scenario includes the pipe, inlet riser, couplers, air-vac vents, all other fittings, and risers placed as specified by the design, trench excavation, pipe bedding and backfill. The site should be evaluated by the designing engineer to make sure the design will function. The transfer pipeline will deliver the manure slurry to the fields for agronomic nutrient utilization according to the CNMP, thereby protecting water quality resources.

Feature Measure: Length of pipe installed

Scenario Unit: Feet

Scenario Typical Size: 1,000.0

Scenario Total Cost: $16,266.42

Scenario Cost/Unit: $16.27

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formless, non reinforced	36	Non reinforced concrete cast-in-placed without forms by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$184.90	1	$184.90
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$5.40	90	$486.00
Trenching, Earth, loam, 24 in. x 48 in.	54	Trenching, earth, loam, 24 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling	Feet	$2.58	1000	$2,580.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	70	$1,693.30
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	20	$906.80
Materials						
Pipe, PVC, 6 in., SDR 21	987	Materials: - 6 inch - PVC - SDR 21 200 psi - ASTM D2241	Feet	$9.04	1100	$9,944.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 634 - Waste Transfer

Scenario: #17 - Agitator, small, mixing contents of a reception pit that is no more than 10 ft. deep.

Scenario Description:

This scenario is for a manure and wastewater agitator associated with an agricultural production operation to transfer agricultural waste product from the production source to a storage facility for proper utilization. This agitator is typically no more than 15 HP and is used for smaller waste storage facilities that are less than 10 feet deep. This scenario does not include a pump. Associated practices may include: PS 313 Waste Storage Facility; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management; PS 633, Waste Recycling. The waste transfer equipment is installed to address water quality concerns by facilitating timely land application of waste at agronomic rates according to the nutrient management plan. This scenario addresses the potential for surface water and groundwater quality degradation.

Before Situation:

In this typical setting, the operator has a small waste storage structure from a confined animal feeding operation without an effective waste handling and transfer system to manage the waste stream departing from the facility.

After Situation:

The typical installation would be for a small manure 10 HP agitator to put settled manure solids into suspension for removal from an animal waste storage structure and transfer to the next step of waste treatment, utilization or storage. Part of an animal waste management system to address water quality concerns. If required a wastewater reception pit, concrete channel or transfer conduit scenario may need to be contracted to support the operation of this waste transfer system equipment.

Feature Measure: Agitator for wastewater, installed

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $8,482.17

Scenario Cost/Unit: $8,482.17

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	11	$375.32
Materials						
Manure agitator, mixing depth less than 10 feet.	1768	Agitator to move put settled manure solids into suspension for removal from an animal waste storage structure. Materials only.	Each	$7,976.67	1	$7,976.67
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	2	$130.18

Practice: 634 - Waste Transfer

Scenario: #18 - Agitator, medium, mixing contents of a reception pit that is 10 ft to 15 ft. deep.

Scenario Description:

This scenario is for a manure and wastewater agitator associated with an agricultural production operation to transfer agricultural waste product from the storage facility to a site for proper utilization. This agitator is typically 30 HP and is used where the waste storage facility tank or pond is between 10 and 15 feet deep. This scenario does not include a pump. Associated practices may include: PS 313 Waste Storage Facility; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management; PS 633, Waste Recycling. The waste transfer equipment is installed to address water quality concerns by facilitating timely land application of waste at agronomic rates according to the nutrient management plan. This scenario addresses the potential for surface water and groundwater quality degradation.

Before Situation:

In this typical setting, the operator has waste production from a confined animal feeding operation without an effective waste handling and transfer system to manage the waste stream departing from the facility.

After Situation:

A typical installation would be for a medium 30 HP manure agitator to put settled manure solids into suspension for removal from an animal waste storage structure and transfer to the next step of waste treatment, utilization or storage. Part of an animal waste management system to address water quality concerns. If required a wastewater reception pit, concrete channel or transfer conduit scenario may need to be contracted to support the operation of this waste transfer system equipment.

Feature Measure: Agitator for wastewater, installed

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $9,633.50

Scenario Cost/Unit: $9,633.50

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	12	$409.44
Materials						
Manure agitator, mixing depth 10 to 15 feet deep	1766	Agitator to move put settled manure solids into suspension for removal from an animal waste storage structure. Materials only.	Each	$8,907.00	1	$8,907.00
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	2	$317.06

Practice: 634 - Waste Transfer

Scenario: #19 - Agitator, large, mixing contents of a reception pit that is over 15 ft. deep.

Scenario Description:

This scenario is for a large manure and wastewater agitator associated with an agricultural production operation to transfer agricultural waste product from the storage facility to a site for proper utilization. This agitator is typically 100 HP and is used where the waste storage facility tank or pond is greater than15 feet deep. This scenario does not include a pump. Associated practices may include: PS 313 Waste Storage Facility; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management; PS 633, Waste Recycling. The waste transfer equipment is installed to address water quality concerns by facilitating timely land application of waste at agronomic rates according to the nutrient management plan. This scenario addresses the potential for surface water and groundwater quality degradation.

Before Situation:

In this typical setting, the operator has waste production from a confined animal feeding operation without an effective waste handling and transfer system to manage the waste stream departing from the facility.

After Situation:

A typical installation would be for a large 100 HP manure agitator to put settled manure solids into suspension for removal from an animal waste storage structure and facilitate the transfer of this material to the next step of waste treatment or utilization. This agitator is for a tank deeper than 15 feet and is part of an animal waste management system to address water quality concerns. This covers the cost of the agitator equipment materials and labor for the electrical hook-up.

Feature Measure: Agitator for wastewater, installed

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $10,496.19

Scenario Cost/Unit: $10,496.19

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	12	$409.44
Materials						
Manure agitator, mixing depth greater than 15 feet deep.	1767	Agitator to move put settled manure solids into suspension for removal from an animal waste storage structure. Materials only.	Each	$9,615.33	1	$9,615.33
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 635 - Vegetated Treatment Area

Scenario: #1 - Graded Area, Gravity Flow Surface Application

Scenario Description:

This is a permanent herbaceous vegetative area or channel installed down slope from a livestock production area. Wastewater (runoff or milking parlor wastewater) is properly collected and released with a controlled gravity outflow into the VTA. The VTA vegetation is harvested to removed nutrients on a regular basis. This practice addresses water quality degradation due to uncontrolled nutrient rich wastewater that can flow into surface waters or leach into ground water. Associated practices: Waste Storage Facility (313), Fence (382), Waste Separation Facility (632), Manure Transfer (634), Roof runoff Management (558), Pumping Plant (533), Subsurface Drain (606), Critical Area Planting (342), Terrace (600), Nutrient Management (590), Diversion (362), Pipeline (516), Land Smoothing (466), Precision Land Forming (462), Waste Treatment (629)

Before Situation:

Nutrient rich wastewater is running off from an animal operation that has the potential to pollute surface waters or ponding and leaching into groundwater.

After Situation:

Typical VTA is 1.0 ac in size, includes a gravel trench for distribution flow (sheet flow) into the VTA. Typically requires grading and shaping, gravel spreader trenches and perforated pipe to maintain sheet flow throughout the VTA. A settling basin for wastewater collection is contracted using Solid/Liquid Waste Separation Facility (632). For milkhouse waste, Waste Treatment (629) could be contracted to provide pre-treatment prior to being released into the VTA. The VTA practice will provide a controlled release of nutrient rich wastewater into a designed vegetative area for nutrient uptake. This system will improve water quality by treating nutrient rich wastewater and prevent contamination of surface and ground water resources.

Feature Measure: Amount of VTA installed

Scenario Unit: Acres

Scenario Typical Size: 1.0

Scenario Total Cost: $7,421.79

Scenario Cost/Unit: $7,421.79

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.37	400	$548.00
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	70	$145.60
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.89	16	$814.24
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	20	$483.80
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	16	$538.24
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	70	$2,104.90
Pipe, PVC, 2 in., SCH 40	976	Materials: - 2 inch - PVC - SCH 40 - ASTM D1785	Feet	$1.27	45	$57.15
Coupling, PVC, endcap, 2 in., SCH 20	1727	2 inch - PVC- SCH 40- ASTM D1785 pipe endcaps. Materials only.	Each	$0.57	15	$8.55
Pipe, PE, 6 in., DR 9, perforated	1728	Materials: - 6 inch - Perforated PE- 160 psi - ASTM D3035 DR 9	Feet	$27.31	80	$2,184.80
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	1	$65.09
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 635 - Vegetated Treatment Area

Scenario: #2 - Graded Area, Pumped Into A Basin, Gravity Flow Surface Application

Scenario Description:

This is a permanent herbaceous vegetative area or channel located upslope from the livestock production area. The topography of the site requires wastewater to be pumped uphill to the VTA designed system. Wastewater (runoff or milking parlor wastewater) is properly collected at the production area and pumped uphill to a shallow tank or basin where it has a controlled gravity outflow into the VTA. The VTA vegetation is harvested to removed nutrients on a regular basis. This practice addresses water quality degradation due to uncontrolled nutrient rich wastewater that can flow into surface waters or leach into ground water. Associated practices: Waste Storage Facility (313), Fence (382), Waste Separation Facility (632), Manure Transfer (634), Irrigation System, Sprinkler (442), Roof runoff Management (558), Pumping Plant (533), Subsurface Drain (606), Critical Area Planting (342), Terrace (600), Nutrient Management (590), Diversion (362), Pipeline (516), Land Smoothing (466), Precision Land Forming (462), Waste Treatment (629).

Before Situation:

Nutrient rich wastewater is running off from an animal operation that has the potential to pollute surface waters or ponding and leaching into groundwater.

After Situation:

Typical VTA is 1.0 ac in size, includes the installation site to be upslope from the production area with a shallow tank or basin that provides a controlled gravity outflow into the VTA. Typically requires grading and shaping, gravel spreader trenches and perferated pipe to maintain sheet flow throughout the VTA. A settling basin for wastewater collection is contracted using Solid/Liquid Waste Separation Facility (632) and Pumping Plant (533) to get the wastewater upslope to the VTA distrubution point. For milkhouse waste, Waste Treatment (629) could be contracted to provide pretreatment prior to being released into the VTA. The VTA practice will provide a controlled release of nutrient rich wastewater into a designed vegetative area for nutrient uptake. This system will improve water quality by treating nutrient rich wastewater and prevent contamination of surface and ground water resources.

Feature Measure: Amount of VTA installed

Scenario Unit: Acres

Scenario Typical Size: 1.0

Scenario Total Cost: $14,199.84

Scenario Cost/Unit: $14,199.84

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$372.36	2	$744.72
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$494.40	12	$5,932.80
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.37	400	$548.00
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	100	$208.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	40	$967.60
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic Yards	$28.74	6	$172.44
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	70	$2,104.90
Pipe, PVC, 2 in., SCH 40	976	Materials: - 2 inch - PVC - SCH 40 - ASTM D1785	Feet	$1.27	45	$57.15
Ball Valve, 4 in.	1726	4 inch ball valve, metal body. Materials only.	Each	$334.64	2	$669.28
Coupling, PVC, endcap, 2 in., SCH 20	1727	2 inch - PVC- SCH 40- ASTM D1785 pipe endcaps. Materials only.	Each	$0.57	15	$8.55
Pipe, PE, 6 in., DR 9, perforated	1728	Materials: - 6 inch - Perforated PE- 160 psi - ASTM D3035 DR 9	Feet	$27.31	80	$2,184.80
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	2	$130.18
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 635 - Vegetated Treatment Area

Scenario: #3 - Graded Area, Mechanical Distribution

Scenario Description:

This is a permanent herbaceous vegetative area located adjacent to a livestock production area. Wastewater (runoff or milking parlor wastewater) is properly collected at the production area and pumped to mechanically distribute wastewater onto the VTA. The VTA vegetation is harvested to removed nutrients on a regular basis. This practice addresses water quality degradation due to uncontrolled nutrient rich wastewater that can flow into surface waters or leach into ground water. Associated practices: Waste Storage Facility (313), Fence (382), Waste Separation Facility (632), Manure Transfer (634), Irrigation System, Sprinkler (442), Roof runoff Management (558), Pumping Plant (533), Subsurface Drain (606), Critical Area Planting (342), Terrace (600), Nutrient Management (590), Diversion (362), Pipeline (516), Land Smoothing (466), Precision Land Forming (462), Waste Treatment (629)

Before Situation:

Nutrient rich wastewater is running off from an animal operation that has the potential to pollute surface waters or ponding and leaching into groundwater.

After Situation:

Typical VTA is 1.0 ac in size, includes the sizing, grading and shaping of the VTA area. Typically requires grading and shaping to maintain sheet flow onto the VTA. A settling basin for wastewater collection is contracted using Solid/Liquid Waste Separation Facility (632) and Pumping Plant (533) to get the wastewater to the VTA mechanical distribution component that is contracted using Irrigation System, Sprinkler (442). For milkhouse waste, Waste Treatment (629) could be contracted to provide pretreatment prior to being pumped and distributed onto the VTA. The VTA practice will provide a controlled release of nutrient rich wastewater into a designed vegetative area for nutrient uptake. This system will improve water quality by treating nutrient rich wastewater and prevent contamination of surface and ground water resources.

Feature Measure: Amount of VTA installed

Scenario Unit: Acres

Scenario Typical Size: 1.0

Scenario Total Cost: $1,975.23

Scenario Cost/Unit: $1,975.23

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.89	16	$814.24
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	16	$387.04
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	16	$538.24
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 635 - Vegetated Treatment Area

Scenario: #4 - Existing Vegetative Area, Gravity Flow Surface Application

Scenario Description:

An existing permanent herbaceous vegetated area that meets the requirements for a VTA and is used as an overland flow area for nutrient rich runoff treatment. A flow distribution component is installed to achieve sheet flow at the start of the VTA. Clean runoff is diverted where possible. The VTA vegetation is harvested to removed nutrients on a regular basis. This practice addresses water quality degradation due to uncontrolled nutrient rich runoff that can flow into surface waters or leach into ground water. Associated practices: Waste Storage Facility (313), Fence (382), Waste Separation Facility (632), Manure Transfer (634), Irrigation System, Sprinkler (442), Roof runoff Management (558), Pumping Plant (533), Subsurface Drain (606), Critical Area Planting (342), Terrace (600), Nutrient Management (590), Diversion (362), Pipeline (516), Land Smoothing (466), Precision Land Forming (462), Waste Treatment Area (629)

Before Situation:

Nutrient rich wastewater is running off from an animal operation that has the potential to pollute surface waters or ponding and leaching into groundwater.

After Situation:

Typical VTA is 1.0 ac in size, includes gravel trenchs and perforated pipe to establish sheet flow into the VTA where an existing permanent herbaceouse vegetated area meets the requirements for a VTA. Does not include any grading or seeding. The VTA practice will provide a controlled release of nutrient rich runoff into an existing vegetative area for nutrient uptake. This system will improve water quality by treating nutrient rich runoff and prevent contamination of surface and ground water resources.

Feature Measure: Amount of VTA treating wastewate

Scenario Unit: Acres

Scenario Typical Size: 1.0

Scenario Total Cost: $10,027.83

Scenario Cost/Unit: $10,027.83

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$494.40	7	$3,460.80
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.37	445	$609.65
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	75	$156.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	16	$387.04
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	75	$2,255.25
Pipe, PVC, 2 in., SCH 40	976	Materials: - 2 inch - PVC - SCH 40 - ASTM D1785	Feet	$1.27	40	$50.80
Coupling, PVC, endcap, 2 in., SCH 20	1727	2 inch - PVC- SCH 40- ASTM D1785 pipe endcaps. Materials only.	Each	$0.57	20	$11.40
Pipe, PE, 6 in., DR 9, perforated	1728	Materials: - 6 inch - Perforated PE- 160 psi - ASTM D3035 DR 9	Feet	$27.31	100	$2,731.00
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	2	$130.18
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 635 - Vegetated Treatment Area

Scenario: #5 - Existing Area, Pod Sprinkler System Distribution

Scenario Description:

This is a permanent herbaceous vegetative area located adjacent to a livestock production area. Wastewater (runoff or milking parlor wastewater) is properly collected at the production area and pumped to mechanically distribute wastewater onto the VTA. The VTA vegetation is harvested to removed nutrients on a regular basis. This practice addresses water quality degradation due to uncontrolled nutrient rich wastewater that can flow into surface waters or leach into ground water. Associated practices: Waste Storage Facility (313), Fence (382), Waste Separation Facility (632), Manure Transfer (634), Irrigation System, Sprinkler (442), Roof runoff Management (558), Pumping Plant (533), Subsurface Drain (606), Critical Area Planting (342), Terrace (600), Nutrient Management (590), Diversion (362), Pipeline (516), Land Smoothing (466), Precision Land Forming (462), Waste Treatment (629)

Before Situation:

Nutrient rich wastewater is running off from an animal operation that has the potential to pollute surface waters or ponding and leaching into groundwater.

After Situation:

Typical VTA is 2.0 ac in size. Typically does not require grading and shaping to maintain as uniform application onto the VTA is made through a mobile pod type sprinkler system. A settling basin for wastewater collection is contracted using Solid/Liquid Waste Separation Facility (632) and Pumping Plant (533) to get the wastewater to the VTA. The system is sized such that the total number of Pods will distribute wastewater to half of the VTA, 1 ac. The pods will be relocated to distribute wastewater to the other half of the VTA. The VTA is 400 ft x 220 ft. A 400 ft pipeline with 8 risers spaced 50 ft apart extends down one side of the VTA. Each Pod Line is 200 ft long with 5 pods spaced at 40 ft increments. The total number of Pods is 20 (8 risers/2 x 5 pods/line = 20 pods). For milkhouse waste, Waste Treatment (629) could be contracted to provide pretreatment prior to being pumped and distributed onto the VTA. The VTA practice will provide a controlled release of nutrient rich wastewater onto a designed vegetative area for nutrient uptake. This system will improve water quality by treating nutrient rich wastewater and prevent contamination of surface and ground water resources.

Feature Measure: Amount of VTA installed

Scenario Unit: Acres

Scenario Typical Size: 2.0

Scenario Total Cost: $10,978.87

Scenario Cost/Unit: $5,489.44

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Trencher, 8 in.	936	Equipment and power unit costs. Labor not included.	Hours	$43.98	8	$351.84
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	16	$387.04
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	8	$211.68
Materials						
Irrigation, Pod System, w/Appurtenances	323	Pod irrigation system that includes pod, pipe, sprinklers, connections, and appurtenances. Includes materials only.	Each	$266.75	20	$5,335.00
Pipe, PVC, 4 in., SDR 21	986	Materials: - 4 inch - PVC - SDR 21 200 psi - ASTM D2241	Feet	$4.16	428	$1,780.48
Ball Valve, 4 in.	1726	4 inch ball valve, metal body. Materials only.	Each	$334.64	8	$2,677.12
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 638 - Water and Sediment Control Basin

Scenario: #1 - WASCOB, greater than 250 CY

Scenario Description:

Typical scenario s for the construction of 700 CY earthen embankment. Outlet is typically an underground outlet. An earthen embankment or combination ridge and channel generally constructed across the slope and minor watercourses to form a sediment trap and water detention basin. Work is done with dozer, scraper, or road grader. Costs include all equipment necessary to excavate, shape, grade and compact the Water and Sediment Control Basin and mobilization of equipment. This practice is utilized to reduce watercourse and gully erosion, trap sediment, reduce and manage onsite and downstream runoff. Sheet and rill erosion will be controlled by other conservation practices.

Before Situation:

Farming fields with excessive slope length has resulted in multiple rills and/or ephemeral gullies that will continue to worsen over time. The excessive erosion may lead to deterioration of receiving waters due to excessive sedimentation and nutrient transport. Resource concern addressed includes soil erosion and water quality by trapping sediment and/or reduce erosion in a field to protect riparian areas and water bodies from sediment deposition. Surface water causes erosion and the sediment (and potentially pesticides) to be transported into the riparian areas and water bodies downstream.

After Situation:

Water and Sediment Control Basis is constructed with 700 CY of excavation/earthfill with dozer, scraper and/or road grader. Rill and/or gully erosion is reduced. If riser and underground outlet are needed, then include Underground Outlet (620). Include Critical Area Planting (342) where necessary to prevent erosion following construction activities.

Feature Measure: CY of WASCOB Embankment

Scenario Unit: Cubic Yards

Scenario Typical Size: 700.0

Scenario Total Cost: $1,772.05

Scenario Cost/Unit: $2.53

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, common earth, small equipment, 50 ft	1220	Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yards	$2.13	700	$1,491.00
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	1	$45.34
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 638 - Water and Sediment Control Basin

Scenario: #2 - WASCOB topsoil

Scenario Description:

Typical scenarios for the construction of 700 CY earthen embankment. Prior to building the embankment, 6 inches of topsoil is removed and stockpiled. Outlet is typically an underground outlet. An earthen embankment or combination ridge and channel generally constructed across the slope and minor watercourses to form a sediment trap and water detention basin. Topsoil is replaced following construction of the embankment. Costs include all equipment necessary to strip and stock pile topsoil, excavate, shape, grade and compact the Water and Sediment Control Basin, spread and replace topsoil after construction and mobilization of equipment. Seeding not included. This practice is utilized to reduce watercourse and gully erosion, trap sediment, reduce and manage onsite and downstream runoff. Sheet and rill erosion will be controlled by other conservation practices. Work is done with dozer, scraper, or road grader.

Before Situation:

Site has shallow topsoil which if removed by earthwork for construction of embankment will significantly impact yields. Farming fields with excessive slope length has resulted in multiple rills and/or ephemeral gullies that will continue to worsen over time. The excessive erosion may lead to deterioration of receiving waters due to excessive sedimentation and nutrient transport. Resource concern addressed includes soil erosion and water quality by trapping sediment and/or reduce erosion in a field to protect riparian areas and water bodies from sediment deposition. Surface water causes erosion and the sediment (and potentially pesticides) is being transported into the riparian areas and water bodies downstream.

After Situation:

Water and Sediment Control Basis is constructed with 700 CY of excavation/earthfill with dozer, scraper and/or road grader. Rill and/or gully erosion is reduced. If riser and underground outlet are needed, then include Underground Outlet (620). Include Critical Area Planting (342) where necessary to prevent erosion following construction activities.

Feature Measure: CY of WASCOB Embankment

Scenario Unit: Cubic Yards

Scenario Typical Size: 700.0

Scenario Total Cost: $1,989.55

Scenario Cost/Unit: $2.84

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Stripping and stockpiling, topsoil	1199	Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor.	Cubic Yards	$0.87	250	$217.50
Excavation, common earth, small equipment, 50 ft	1220	Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yards	$2.13	700	$1,491.00
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	1	$45.34
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 638 - Water and Sediment Control Basin

Scenario: #3 - WASCOB less than 250 CY

Scenario Description:

Typical scenario s for the construction of 200 CY earthen embankment. Outlet is typically an underground outlet. An earthen embankment or combination ridge and channel generally constructed across the slope and minor watercourses to form a sediment trap and water detention basin. Work is done with dozer, scraper, or road grader. Costs include all equipment necessary to excavate, shape, grade and compact the Water and Sediment Control Basin and mobilization of equipment. This practice is utilized to reduce watercourse and gully erosion, trap sediment, reduce and manage onsite and downstream runoff. Sheet and rill erosion will be controlled by other conservation practices.

Before Situation:

Farming fields with excessive slope length has resulted in multiple rills and/or ephemeral gullies that will continue to worsen over time. The excessive erosion may lead to deterioration of receiving waters due to excessive sedimentation and nutrient transport. Resource concern addressed includes soil erosion and water quality by trapping sediment and/or reduce erosion in a field to protect riparian areas and water bodies from sediment deposition. Surface water causes erosion and the sediment (and potentially pesticides) to be transported into the riparian areas and water bodies downstream.

After Situation:

Water and Sediment Control Basis is constructed with 200 CY of excavation/earthfill with dozer, scraper and/or road grader. Rill and/or gully erosion is reduced. If riser and underground outlet are needed, then include Underground Outlet (620). Include Critical Area Planting (342) where necessary to prevent erosion following construction activities.

Feature Measure: CY of WASCOB Embankment

Scenario Unit: Cubic Yards

Scenario Typical Size: 200.0

Scenario Total Cost: $707.05

Scenario Cost/Unit: $3.54

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, common earth, small equipment, 50 ft	1220	Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yards	$2.13	200	$426.00
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	1	$45.34
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 642 - Water Well

Scenario: #1 - Well <=100 Ft

Scenario Description:

Typical construction is for the installation of a well, in areas where sufficient water is known to occur at <100 feet of depth from the ground surface. The well shall be drilled, dug, driven, bored, jetted or otherwise constructed to an aquifer for water supply. The purpose of the practice is to provide water for livestock or improve the efficiency of an existing irrigation system. An average well depth is 50 feet, using PVC or steel well casings 4-6" in diameter.

Before Situation:

Livestock have insufficient water or are fenced from their water source. Major resource concern is Inadequate Water for domestic animals or wildlife.

After Situation:

Sufficient water is available for livestock or wildlife. Utilize Pumping Plant (533) and Pipeline (516) as associated practices. Use Critical Area Seeding (342) where necessary to prevent erosion following construction activities.

Feature Measure: Depth of Well

Scenario Unit: Feet

Scenario Typical Size: 50.0

Scenario Total Cost: $3,165.51

Scenario Cost/Unit: $63.31

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Rotary Drill Rig	1595	Rotary drill rig including equipment and power unit costs. Labor not included.	Hours	$311.84	4	$1,247.36
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	4	$96.76
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	2	$90.68
Materials						
Grout, cement	1333	Cement grout meeting ASTM specifications for well sealing. Includes both neat-cement grout and bentonite gout mixtures. Includes materials, equipment and labor to place.	Cubic Yards	$501.26	1	$501.26
Well Cap, 6 in.	1786	Well cap, 6 inch. Materials only.	Each	$38.27	1	$38.27
Well Casing, Plastic, 6 in.	1804	PVC or ABS non-threaded well casing, 6 inch. Materials only.	Feet	$9.53	30	$285.90
Well Casing, Metal, 6 in.	1810	Steel well casing, 6 inch. Materials only.	Feet	$20.66	21	$433.86
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 642 - Water Well

Scenario: #2 - Well >100-300 Ft

Scenario Description:

Typical construction is for the installation of a well, in areas where sufficient water is known to occur at >100-300 feet of depth from the ground surface. The well shall be drilled, dug, driven, bored, jetted or otherwise constructed to an aquifer for water supply. The purpose of the practice is to provide water for livestock or improve the efficiency of an existing irrigation system. An average well depth is 200 feet, using PVC or steel well casings 4-6" in diameter.

Before Situation:

Livestock have insufficient water or are fenced from their water source. Major resource concern is Inadequate Water for domestic animals or wildlife.

After Situation:

Sufficient water is available for livestock or wildlife. Utilize Pumping Plant (533) and Pipeline (516) as associated practices. Use Critical Area Seeding (342) where necessary to prevent erosion following construction activities.

Feature Measure: Depth of Well

Scenario Unit: Feet

Scenario Typical Size: 200.0

Scenario Total Cost: $8,899.41

Scenario Cost/Unit: $44.50

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Rotary Drill Rig	1595	Rotary drill rig including equipment and power unit costs. Labor not included.	Hours	$311.84	16	$4,989.44
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	16	$387.04
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	8	$362.72
Materials						
Grout, cement	1333	Cement grout meeting ASTM specifications for well sealing. Includes both neat-cement grout and bentonite gout mixtures. Includes materials, equipment and labor to place.	Cubic Yards	$501.26	1	$501.26
Well Cap, 6 in.	1786	Well cap, 6 inch. Materials only.	Each	$38.27	1	$38.27
Well Casing, Plastic, 6 in.	1804	PVC or ABS non-threaded well casing, 6 inch. Materials only.	Feet	$9.53	180	$1,715.40
Well Casing, Metal, 6 in.	1810	Steel well casing, 6 inch. Materials only.	Feet	$20.66	21	$433.86
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 642 - Water Well

Scenario: #3 - Well >300-600 Ft

Scenario Description:

Typical construction is for the installation of a well, in areas where sufficient water is known to occur at 300 - 600 feet of depth from the ground surface. The well shall be drilled, dug, driven, bored, jetted or otherwise constructed to an aquifer for water supply. The purpose of the practice is to provide water for livestock or improve the efficiency of an existing irrigation system. An average well depth is 450 feet, using PVC or steel casing 4-6" in diameter.

Before Situation:

Livestock have insufficient water or are fenced from their water source. Major resource concern is Inadequate Water for domestic animals or wildlife.

After Situation:

Sufficient water is available for livestock or wildlife. Utilize Pumping Plant (533) and Pipeline (516) as associated practices. Use Critical Area Seeding (342) where necessary to prevent erosion following construction activities.

Feature Measure: Depth of Well

Scenario Unit: Feet

Scenario Typical Size: 450.0

Scenario Total Cost: $18,455.91

Scenario Cost/Unit: $41.01

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Rotary Drill Rig	1595	Rotary drill rig including equipment and power unit costs. Labor not included.	Hours	$311.84	36	$11,226.24
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	36	$870.84
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	18	$816.12
Materials						
Grout, cement	1333	Cement grout meeting ASTM specifications for well sealing. Includes both neat-cement grout and bentonite gout mixtures. Includes materials, equipment and labor to place.	Cubic Yards	$501.26	1	$501.26
Well Cap, 6 in.	1786	Well cap, 6 inch. Materials only.	Each	$38.27	1	$38.27
Well Casing, Plastic, 6 in.	1804	PVC or ABS non-threaded well casing, 6 inch. Materials only.	Feet	$9.53	430	$4,097.90
Well Casing, Metal, 6 in.	1810	Steel well casing, 6 inch. Materials only.	Feet	$20.66	21	$433.86
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 642 - Water Well

Scenario: #4 - Well >600 Ft

Scenario Description:

Typical construction is for the installation of a well, in areas where sufficient water is known to occur > 600 feet of depth from the ground surface. The well shall be drilled, dug, driven, bored, jetted or otherwise constructed to an aquifer for water supply. The purpose of the practice is to provide water for livestock or improve the efficiency of an existing irrigation system. An average well depth is 700 feet, using PVC or steel casing 4-6" in diameter.

Before Situation:

Livestock have insufficient water or are fenced from their water source. Major resource concern is Inadequate Water for domestic animals or wildlife.

After Situation:

Sufficient water is available for livestock or wildlife. Utilize Pumping Plant (533) and Pipeline (516) as associated practices. Use Critical Area Seeding (342) where necessary to prevent erosion following construction activities.

Feature Measure: Depth of Well

Scenario Unit: Feet

Scenario Typical Size: 700.0

Scenario Total Cost: $28,513.67

Scenario Cost/Unit: $40.73

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Rotary Drill Rig	1595	Rotary drill rig including equipment and power unit costs. Labor not included.	Hours	$311.84	56	$17,463.04
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	56	$1,354.64
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	28	$1,269.52
Materials						
Grout, cement	1333	Cement grout meeting ASTM specifications for well sealing. Includes both neat-cement grout and bentonite gout mixtures. Includes materials, equipment and labor to place.	Cubic Yards	$501.26	2	$1,002.52
Well Cap, 6 in.	1786	Well cap, 6 inch. Materials only.	Each	$38.27	1	$38.27
Well Casing, Plastic, 6 in.	1804	PVC or ABS non-threaded well casing, 6 inch. Materials only.	Feet	$9.53	680	$6,480.40
Well Casing, Metal, 6 in.	1810	Steel well casing, 6 inch. Materials only.	Feet	$20.66	21	$433.86
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 642 - Water Well

Scenario: #5 - Dug Well

Scenario Description:

Typical construction is for the excavation of a shallow dug well. The purpose of the practice is to provide water for livestock. A typical dug well is 4 foot in diameter and 15 feet in depth. The well is excavated using a backhoe. Excavate to a depth where the water recharge is greater than the equipment can remove. Washed gravel is placed in the base of the dug opening. Concrete manhole risers are installed to hold the water. Pea gravel is placed above the washed gravel to transition to the earth backfill. The hole is backfilled and sloped to direct surface water away from entering the manhole cover.

Before Situation:

Livestock have insufficient water or are fenced from their water source.

After Situation:

Sufficient water is available for livestock. Utilize Pumping Plant (533) and Pipeline (516) as associated practices. Use Critical Area Seeding (342) where necessary to prevent erosion following construciton activities.

Feature Measure: No.

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $12,547.68

Scenario Cost/Unit: $12,547.68

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$29.47	10	$294.70
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	10	$241.90
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	10	$336.40
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	3	$90.21
Test, Standard Water Test, Well Water	309	Well Water Suitability test. Includes materials and shipping only.	Each	$47.11	1	$47.11
Manhole, 4 ft x 4 ft	1053	Precast Manhole with base and top delivered. 4 feet diameter x 4 feet. Includes materials only.	Each	$1,547.73	5	$7,738.65
Aggregate, gravel, washed, pea gravel	1331	Washed and graded pea gravel river stone. Includes materials and local delivery within 20 miles of quarry.	Cubic Yards	$32.33	1	$32.33
Grout, cement	1333	Cement grout meeting ASTM specifications for well sealing. Includes both neat-cement grout and bentonite gout mixtures. Includes materials, equipment and labor to place.	Cubic Yards	$501.26	7	$3,508.82
Chlorine	1335	Liquid chlorine bleach. Includes materials only.	Gallons	$4.37	5	$21.85
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 642 - Water Well

Scenario: #6 - Remote Locations

Scenario Description:

Typical construction is for the installation of a well, in areas where sufficient water is known to occur >300 feet of depth from the ground surface. The well shall be drilled, dug, driven, bored, jetted or otherwise constructed to an aquifer for water supply. The purpose of the practice is to provide water for livestock. An average well depth is 400 feet. Well casings are 4-6" in diameter. Steel casing is installed to a depth of 400 feet. Location is remote - more than 50 miles from an improved roadway.

Before Situation:

Remote locations where livestock have insufficient water or are fenced from their water source.

After Situation:

Sufficient water is available for livestock or micro-irrigation. Utilize Pumping Plant (533) and Pipeline (516) as associated practices. Use Critical Area Seeding (342) where necessary to prevent erosion following construciton activities.

Feature Measure: Depth of Well

Scenario Unit: Feet

Scenario Typical Size: 400.0

Scenario Total Cost: $20,115.47

Scenario Cost/Unit: $50.29

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Rotary Drill Rig	1595	Rotary drill rig including equipment and power unit costs. Labor not included.	Hours	$311.84	40	$12,473.60
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	40	$967.60
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	20	$906.80
Materials						
Grout, cement	1333	Cement grout meeting ASTM specifications for well sealing. Includes both neat-cement grout and bentonite gout mixtures. Includes materials, equipment and labor to place.	Cubic Yards	$501.26	2	$1,002.52
Well Cap, 6 in.	1786	Well cap, 6 inch. Materials only.	Each	$38.27	1	$38.27
Well Casing, Plastic, 6 in.	1804	PVC or ABS non-threaded well casing, 6 inch. Materials only.	Feet	$9.53	380	$3,621.40
Well Casing, Metal, 6 in.	1810	Steel well casing, 6 inch. Materials only.	Feet	$20.66	21	$433.86
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	200	$200.00
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	2	$471.42

Practice: 643 - Restoration of Rare or Declining Natural Communities

Scenario: #1 - Habitat Monitoring and Management, Very-Low Intensity and Complexity

Scenario Description:

This scenario is applied to all landuse types were the native plant condition (i.e. T&E plant species) or wildlife habitat is the resource concern, and where very-low intensity and complexity of monitoring or management will treat the identified resource concern. Only 1 monitoring effort is needed and each requiring 2 people and 4 hours per effort. The adaptive management actions such as cutting of limbs that are impeding access of birds into nest boxs, replacing damaged fence markers, cleaning of nest structures and debris around other structures requires only hand labor and less than 16 hours of labor per year.

Before Situation:

Rare or declining habitat is deficient and annual monitoring and adaptive management actions of very-low intensity and complexity will improved conditions.

After Situation:

Rare and declining habitat is improved by implementation of annual adaptive management actions of very- low intensity and complexity.

Feature Measure: Monitoring efforts and adaptive m

Scenario Unit: Acres

Scenario Typical Size: 640.0

Scenario Total Cost: $704.23

Scenario Cost/Unit: $1.10

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.59	2	$13.18
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	3	$66.87
Rangeland/grassland field monitoring kit	967	Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only.	Each	$48.65	1	$48.65
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	10	$241.90
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	3	$333.63

Practice: 643 - Restoration of Rare or Declining Natural Communities

Scenario: #2 - Habitat Monitoring and Management, Low Intensity and Complexity

Scenario Description:

This scenario is applied to all landuse types including those with wildlife as a modifier, where native plant conditions (T&E plants) or wildlife have been identified as the resource concern, and where low intensity and complexity of monitoring or management will treat the identified resource concern. Only 1 monitoring effort is needed and each requiring 2 people and 3 hours per effort. The adaptive management actions such as cutting of limbs that are impeding access of birds into nest boxs, replacing damaged fence markers, cleaning of nest structures and debris around other structures requires only hand labor and less than 8 hours labor per year.

Before Situation:

Rare or declining habitat is deficient due to the absence of annual monitoring and adaptive management actions of low intensity and complexity.

After Situation:

Rare and declining habitat is improved by implementation of annual adaptive management actions of low intensity and complexity.

Feature Measure: Monitoring efforts and adaptive m

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $451.65

Scenario Cost/Unit: $4.52

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.59	1	$6.59
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	3	$66.87
Rangeland/grassland field monitoring kit	967	Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only.	Each	$48.65	1	$48.65
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	8	$193.52
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	3	$136.02

Practice: 643 - Restoration of Rare or Declining Natural Communities

Scenario: #3 - Habitat Monitoring and Management, Medium Intensity, with FI

Scenario Description:

This scenario is applied to all landuse types including those with wildlife as a modifier, where any resource concern is identified related to rare or declining habitats, and where medium intensity and complexity of monitoring or management will treat the identified resource concern. Two monitoring efforts are needed and each requiring 2 people and 3 hours per effort. Two adaptive management efforts are required (such as cutting of limbs that impede monitoring efforts, replacing damaged fence markers, or other minor adaptive management activities). The adaptive mgmt requires hand labor and the occasional use of light equipment. A crew of 2 is needed for the hand labor efforts. Mowing of roads and trail is required to provide access for monitoring and management.

Before Situation:

Rare or declining habitat is deficient due to the absence of annual monitoring and adaptive management actions of medium intensity and complexity.

After Situation:

Rare or declining habitat is improved by implementation of annual adaptive management actions of medium intensity and complexity.

Feature Measure: Monitoring efforts and adaptive m

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $2,352.79

Scenario Cost/Unit: $23.53

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$109.25	1	$109.25
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.59	6	$39.54
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	8	$178.32
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$18.46	50	$923.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	18	$435.42
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	6	$667.26

Practice: 643 - Restoration of Rare or Declining Natural Communities

Scenario: #4 - Habitat Monitoring and Management, High Intensity and Complexity, with Forgone Income

Scenario Description:

This scenario is applied to all landuse types including those with wildlife as a modifier, where any resource concern is identified for wildlife, and where high intensity and complexity of monitoring or management will treat the identified resource concern. Two monitoring efforts are needed and each requiring 2 people and 4 hours per effort. Two adaptive management efforts are required (such as cutting of limbs that impede monitoring efforts, replacing damaged fence markers, or other minor adaptive management activities). The adaptive mgmt requires hand labor and the occasional use of light equipment. A crew of 2 is needed for the hand labor efforts. Mowing of roads and trail is required to provide access for monitoring and management.

Before Situation:

Wildlife habitat is deficient due to the absence of annual monitoring and adaptive management actions of high intensity and complexity.

After Situation:

Wildlife habitat is improved by implementation of annual adaptive management actions of high intensity and complexity.

Feature Measure: Monitoring efforts and adaptive m

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $4,087.82

Scenario Cost/Unit: $40.88

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.59	8	$52.72
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	16	$356.64
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hours	$46.50	5	$232.50
Rangeland/grassland field monitoring kit	967	Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only.	Each	$48.65	2	$97.30
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$18.46	50	$923.00
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	8	$272.96
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	28	$677.32
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	5	$132.30
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	10	$453.40
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	8	$889.68

Practice: 643 - Restoration of Rare or Declining Natural Communities

Scenario: #5 - Development of Shallow Micro-Topographic Features with Normal Farming Equipment.

Scenario Description:

This typical scenario is installed on open non-wetlands. The purpose is to increase plant species richness and diversity, create micro-habitats for invertebrates, increase water infiltration and reduce run-off. The area is plowed to loosen the soil. Then the soil is excavated with normal farming equipment (e.g. tractor and box-blade) to a depth of 2-6 inches and immediately deposited. This lowering and raising of a box-blade restores the original micro-topographic features (6' X 6' depressions and mounds) common to most landscapes and landforms prior to clearing, tilling, and annual mowing. Restoration of shallow but frequent micro-topographic features has been lost by the smoothing action of tillage, mowing and the original land-clearing. This scenario it typically implemented for ecosystem restoration projects such as prairie restoration and range-land restoration, and particularly on moderately well-drained soils.

Before Situation:

Micro-topographic features have been eliminated by past conversion to agriculture and/or past cultural practices. This has resulted in the lack of micro-soil moisture gradients within the field. The opportunity for plant species richness and diversity is minimal. Water storage potential is absent. Water rapidly runs off the field after rains and snow melt, carrying nutrients, solids and surface organic materials. No micro-ponding sites are available for invertebrate use.

After Situation:

Shallow micro-depressions and mounds are numerous. This varied micro-topographic features provided varied moisture gradients required for high plant species richness and diversity. Wildlife habitat is improved. Water conservation is increased, increasing vegetative production. Water quality is improved as the micro depressions capture sediments, nutrients and manure. Over time, the micro-depressions become more nutrient rich than the micro-highs, further increasing plant species richness.

Feature Measure: hours of tractor use

Scenario Unit: Acres

Scenario Typical Size: 20.0

Scenario Total Cost: $742.04

Scenario Cost/Unit: $37.10

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acres	$15.10	20	$302.00
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$46.88	6	$281.28
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	6	$158.76

Practice: 643 - Restoration of Rare or Declining Natural Communities

Scenario: #6 - Development of Deep Micro-Topographic Features with Heavy Equipment.

Scenario Description:

This typical scenario is installed on open non-wetlands, where micro-topographic features have been removed by past farming and/or ranching cultural practices. The purpose is to increase plant species richness and diversity, create micro-habitats for invertebrates, increase water infiltration and reduce run-off. The area is plowed 2 weeks prior to excavation to kill existing vegetation and allow for proper dirt work. Then the soil is excavated with track equipment (dozer) to a depth of 6-12 inches and immediately deposited. This lowering and raising of a dozer -blade restores the original deep micro-topographic features (10' X10' depressions and mounds) common to many landscapes and landforms prior to the lands conversion to agricultural lands. This scenario it typically implemented for ecosystem restoration projects such as wetland restoration (herbaceous or prior to planting of woody species), prairie restoration and range-land restoration. It is most commonly applied to well-drained soils as the purpose is for the micro-depression to pond water for short duration (less than 7 days).

Before Situation:

Micro-topographic features have been eliminated by past conversion to agriculture and/or past cultural practices. This has resulted in the lack of micro-soil moisture gradients within the field. The opportunity for plant species richness and diversity is minimal. Water storage potential is absent. Water rapidly runs off the field after rains and snow melt, carrying nutrients, solids and surface organic materials. No micro-ponding sites are available aquatic dependent invertebrates. Vertebrate wildlife habitat is lacking diversity.

After Situation:

Deep (6" - 12" depth) micro-depressions and mounds are numerous. These varied micro-topographic features provide varied moisture gradients required for development of high plant species richness and diversity. Wildlife habitat is improved. Water conservation is increased, increasing vegetative production. Water quality is improved as the deep micro-depressions capture sediments, nutrients and manure. Over time, the micro-depressions become more nutrient rich than the micro-highs, further increasing plant species richness.

Feature Measure: Hours

Scenario Unit: Acres

Scenario Typical Size: 20.0

Scenario Total Cost: $2,164.99

Scenario Cost/Unit: $108.25

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 200 HP	928	Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included.	Hours	$190.64	6	$1,143.84
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acres	$15.10	20	$302.00
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	8	$269.12
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	1	$450.03

Practice: 643 - Restoration of Rare or Declining Natural Communities

Scenario: #16 - Micro Structures for arid land restoration

Scenario Description:

Very small structures, typically 12-18 inches tall and 15-25 feet long, are constructed in ephemeral water flow patterns that occur on arid lands that need to be restored. This captures and retains small pockets of moisture on the landscape to facilitate plant establishment. Typically constructed with fill materials from the site and with multiple structures in an area. Used in conjunction with Range Planting, Critical Area Planting, or Tree and Shrub establishment. May be constructed with small equipment or manually.

Before Situation:

Arid land with a degraded plant community that requires restoration. Resource concerns could include plant community health or wildlife habitat.

After Situation:

Structure impounds water on a small area creating a resource island for plant establishment.

Feature Measure: per structure

Scenario Unit: Each

Scenario Typical Size: 10.0

Scenario Total Cost: $1,130.59

Scenario Cost/Unit: $113.06

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$29.47	16	$471.52
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	16	$423.36
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 643 - Restoration of Rare or Declining Natural Communities

Scenario: #32 - Rock Structure

Scenario Description:

A low cost, low risk rock structure will be installed at the head of the gully to arrest the continued cutting of the gully up hill. The structure is designed to protect the soil surface from further erosion while dissipating water energy. Below the headcut structure a series of structures will be installed to reduce water velocity and cause deposition of sediments to heal the gully and reduce drainage from the adjacent upland area. This will reduce the loss of and restore mesic riparian/meadow habitats. Typical installation involves the installation of one structure to address head-cutting and three additional structures to reduce stream velocity and collect sediment. The headcut structure typically requires 1.5 cubic yards of rock. Typical sediment checks require 1.0 cubic yards of rock. This scenario addresses Soil Erosion, classic gully and inadequate fish and wildlife habitat.

Before Situation:

Head cutting is proceeding uphill creating a gully that serves as a drain to the adjacent habitat lowering the local water table reducing the available moisture to the adjacent mesic plant communities. Mesic riparian/meadow habitats shift to more xeric habitats and the period of active growth is reduced.

After Situation:

Head cut is arrested, stopping the advance of the gully uphill and protecting mesic riparian/meadow habitats upstream. Additionally sediment is collected, raising the base of the gully and restoring the hydrologic regime and mesic riparian/meadow habitats. Revegetation is generally via natural regeneration. Should additional revegetation be needed, use vegetation standards, 612, Tree and shrub establishment, 550, Range Planting, 342 Critical Area Treatment.

Feature Measure: Cubic Yard

Scenario Unit: Each

Scenario Typical Size: 4.0

Scenario Total Cost: $2,694.65

Scenario Cost/Unit: $673.66

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$29.47	8	$235.76
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	1	$22.29
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$19.49	2	$38.98
Truck, dump, 8 CY	1401	Dump truck for moving bulk material. Typically capacity is 12 ton or 8 cubic yards. Includes equipment only.	Hours	$54.27	8	$434.16
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	8	$272.96
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	64	$1,548.16
Materials						
Rock Riprap, graded, angular, material and shipping	1200	Graded Rock Riprap for all gradation ranges. Includes materials and delivery only.	Ton	$31.63	4.5	$142.34

Practice: 643 - Restoration of Rare or Declining Natural Communities

Scenario: #51 - Beaver Dam Analogues or Post-Assisted Log Structures

Scenario Description:

This scenario includes installation of low-tech woody structures (Beaver Dam Analogues (BDAs) or Post-Assisted Log Structures (PALS)) to facilitate process-based restoration in perennial, intermittent, or ephemeral streams and riparian areas. These simple structures are low, semi-permeable, and hand-built using native materials (wood, sod, etc.). Untreated wooden fence posts are added where necessary for extra stability. Structures are designed to be short-lived and used primarily as a temporary tool to promote natural process recovery. Structures mimic the function of natural beaver dams and wood accumulation in streams by reducing water velocities, raising water tables, enhancing floodplain connectivity, and inducing other dynamic ecological and hydrogeomorphic processes. Typically, complexes consisting of multiple structures within a reach are used to meet project objectives. Structures can be used on all land uses to address a variety of resource concerns and are strategically placed to meet specific purposes, such as, mesic and wetland vegetation expansion, floodplain development in incised channels, increased habitat complexity for fish and wildlife, and beaver re-establishment. Associated practices include: 528, 391, 644, 612, 382. Typical scenario includes 20 structures averaging 20 ft length each (total = 400 lin ft of structures). Crew of one biologist, one crew manager, and three laborers (one skilled).

Before Situation:

Degraded stream channel and associated riparian/mesic/wetland vegetation are impaired by lack of structural complexity, channel incision, reduced floodplain connectivity, or inadeqaute habitat features. Extent of potential riparian/mesic/wetland vegetation is reduced due to lack of floodplain inundation or low water table. Channel condition/complexity is insufficient to permit proper hydrologic function, vegetation maintenance/recovery, or to support desired fish and wildlife habitat.

After Situation:

Low-tech structures mimic and promote ecological and physical processes that foster recovery of streams, riparian areas, wet meadows, or aquatic ecosystems. Channel complexity is increased and condition improved by promoting riparian/mesic/wetland vegetation expansion, reconnecting floodplains, and increasing habitat structure for fish and wildlife. Additional treatments may be needed through time until ecosystem is self-sustaining.

Feature Measure: Linear Feet

Scenario Unit: Linear Feet

Scenario Typical Size: 400.0

Scenario Total Cost: $15,672.89

Scenario Cost/Unit: $39.18

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.59	24	$158.16
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	12	$267.48
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$19.49	18	$350.82
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$11.47	48	$550.56
Portable Post Driver	2722	Gas or Hydraulic Powered Post Driver, Portable, <300 lbs, labor not included	Hours	$20.68	48	$992.64
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	72	$2,456.64
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	120	$2,902.80
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	60	$2,720.40
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	30	$3,336.30
Materials						
Post, Wood, Untreated, 3-4 in. x 7 ft.	2721	Round Post, Wood, Untreated, 3-4 inch diameter x 7 feet	Each	$4.68	400	$1,872.00
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	1	$65.09

Practice: 644 - Wetland Wildlife Habitat Management

Scenario: #1 - Habitat Monitoring and Management, Very-Low Intensity and Complexity

Scenario Description:

This scenario is applied to wetlands within all landuse types including those with wildlife as a modifier, where any resource concern is identified for wildlife, and where very-low intensity and complexity of monitoring or management will treat the identified resource concern. Only 1-2 monitoring efforts are needed and each requiring less than 2 people and 4 hours per effort. The adaptive management actions such as cutting of limbs that are impeding access of birds into nest boxs, replacing damaged fence markers, cleaning of nest structures and debris around other structures requires only hand labor and less than 16 hours of labor per year.

Before Situation:

Wetland wildlife habitat is deficient due to the absence of annual monitoring and adaptive management actions of very-low intensity and complexity.

After Situation:

Wetland wildlife habitat is improved by implementation of annual adaptive management actions of very- low intensity and complexity.

Feature Measure: Monitoring efforts and adaptive m

Scenario Unit: Acres

Scenario Typical Size: 640.0

Scenario Total Cost: $704.23

Scenario Cost/Unit: $1.10

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.59	2	$13.18
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	3	$66.87
Rangeland/grassland field monitoring kit	967	Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only.	Each	$48.65	1	$48.65
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	10	$241.90
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	3	$333.63

Practice: 644 - Wetland Wildlife Habitat Management

Scenario: #2 - Wetland Wildlife Habitat Monitoring and Management, Low Intensity and Complexity

Scenario Description:

This scenario is applied to wetlands on landuse types including those with wildlife as a modifier, where any resource concern is identified for wildlife, and where low intensity and complexity of monitoring or management will treat the identified resource concern. Only 1-2 monitoring efforts are needed and each requiring less than 2 people and 4 hours per effort. The adaptive management actions such as cutting of limbs that are impeding access of birds into nest boxs, replacing damaged fence markers, cleaning of nest structures and debris around other structures requires only hand labor and less than 8 hours labor per year.

Before Situation:

Wetland wildlife habitat is deficient due to the absence of annual monitoring and adaptive management actions of low intensity and complexity.

After Situation:

Based on the results of a state-approved wetland wildlife habitat assessment process, the application of wetland wildlife habitat management efforts and prescribed monitoring have been implemented. With the application of this practice alone, or in combination with other supporting and facilitating practices, the inadequate wetland wildlife habitat conditions have addressed. Monitoring has maximized the benefits of the needed wetland wildlife habitat treatment efforts.

Feature Measure: Monitoring efforts and adaptive m

Scenario Unit: Acres

Scenario Typical Size: 50.0

Scenario Total Cost: $543.26

Scenario Cost/Unit: $10.87

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.59	1	$6.59
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	1.5	$33.44
Rangeland/grassland field monitoring kit	967	Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only.	Each	$48.65	1	$48.65
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	5	$120.95
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	3	$333.63

Practice: 644 - Wetland Wildlife Habitat Management

Scenario: #3 - Habitat Monitoring and Management, Medium Intensity and Complexity, with Foregone Income

Scenario Description:

This scenario is applied to wetland areas located on all landuse types including those with wildlife as a modifier, where any resource concern is identified for wildlife, and where medium intensity and complexity of monitoring or management will treat the identified resource concern. Two or three monitoring efforts are needed and each requiring less than 2 people and less than 8 hours per effort. Two or three adaptive management efforts are required (such as cutting of limbs that are impeding access of birds into nest boxes, replacing damaged fence markers, cleaning of nest structures and debris around other structures). The adaptive mgmt requires hand labor and the occasional use of light equipment. A crew of 2 is needed for the hand labor efforts and the crew will require less than 16 total hours of labor per mgmt effort. Mowing of roads and trail is required to provide access for monitoring and management. Deferment of use for one season to implement adaptive managment action will be needed.

Before Situation:

Wetland wildlife habitat is deficient due to the absence of annual monitoring and adaptive management actions of medium intensity and complexity.

After Situation:

Based on the results of a state-approved wetland wildlife habitat assessment process, the application of wetland wildlife habitat management efforts and prescribed monitoring have been implemented. With the application of this practice alone, or in combination with other supporting and facilitating practices, the inadequate wetland wildlife habitat conditions have addressed. Monitoring has maximized the benefits of the needed wetland wildlife habitat treatment efforts.

Feature Measure: Monitoring efforts and adaptive m

Scenario Unit: Acres

Scenario Typical Size: 80.0

Scenario Total Cost: $3,646.25

Scenario Cost/Unit: $45.58

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.59	4	$26.36
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	6	$133.74
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hours	$46.50	5	$232.50
Rangeland/grassland field monitoring kit	967	Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only.	Each	$48.65	1	$48.65
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$18.46	80	$1,476.80
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	20	$483.80
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	5	$132.30
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	10	$1,112.10

Practice: 644 - Wetland Wildlife Habitat Management

Scenario: #4 - Habitat Monitoring and Management, High Intensity and Complexity, with Foregone Income

Scenario Description:

This scenario is applied to all landuse types including those with wildlife as a modifier, where any resource concern is identified for wildlife, and where high intensity and complexity of monitoring or management will treat the identified resource concern. Two - four monitoring efforts are needed and each requiring less than 2 people and less than 8 hours per effort. The adaptive management actions (2 - 5 efforts) such as cutting of limbs that are impeding access of birds into nest boxes, replacing damaged fence markers, cleaning of nest structures and debris around other structures requires hand labor and light equipment, requiring a 2-person crew less than 1 day per effort. Deferment of use for one season to implement adaptive managment action will be needed.

Before Situation:

Wildlife habitat is deficient due to the absence of annual monitoring and adaptive management actions of high intensity and complexity.

After Situation:

Based on the results of a state-approved wetland wildlife habitat assessment process, the application of wetland wildlife habitat management efforts and prescribed monitoring have been implemented. With the application of this practice alone, or in combination with other supporting and facilitating practices, the inadequate wetland wildlife habitat conditions have addressed. Monitoring has maximized the benefits of the needed wetland wildlife habitat treatment efforts.

Feature Measure: Monitoring efforts and adaptive m

Scenario Unit: Acres

Scenario Typical Size: 40.0

Scenario Total Cost: $3,326.17

Scenario Cost/Unit: $83.15

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$100.83	4	$403.32
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.59	8	$52.72
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	6	$133.74
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hours	$46.50	3	$139.50
Rangeland/grassland field monitoring kit	967	Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only.	Each	$48.65	1	$48.65
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$18.46	40	$738.40
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	20	$483.80
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	3	$79.38
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	4	$134.56
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	10	$1,112.10

Practice: 644 - Wetland Wildlife Habitat Management

Scenario: #5 - Development of Shallow Micro-Topographic Features with Normal Farming Equipment.

Scenario Description:

This typical scenario is installed on non-forested wetlands, including openlands prior to tree planting. The purpose is to increase plant species richness and diversity, create micro-habitats for invertebrates, increase water infiltration and reduce run-off. The area is plowed to loosen the soil. Then the soil is excavated with normal farming equipment (e.g. tractor and box-blade) to a depth of 2-6 inches and immediately deposited. This lowering and raising of a box-blade restores the original micro-topographic features (6' X 6' depressions and mounds) common to most landscapes and landforms prior to clearing, tilling, and annual mowing. Restoration of shallow but frequent micro-topographic features has been lost by the smoothing action of tillage, mowing and the original land-clearing. This scenario it typically implemented for ecosystem restoration projects such as prairie restoration and range-land restoration, and particularly on moderately well-drained soils.

Before Situation:

Micro-topographic features have been eliminated by past conversion to agriculture and/or past cultural practices. This has resulted in the lack of micro-soil moisture gradients within the field. The opportunity for plant species richness and diversity is minimal. Water storage potential is absent. Water rapidly runs off the field after rains and snow melt, carrying nutrients, solids and surface organic materials. No micro-ponding sites are available for invertebrate use.

After Situation:

Shallow micro-depressions and mounds are numerous. This varied micro-topographic features provided varied moisture gradients required for high plant species richness and diversity. Wildlife habitat is improved. Water conservation is increased, increasing vegetative production. Water quality is improved as the micro depressions capture sediments, nutrients and manure. Over time, the micro-depressions become more nutrient rich than the micro-highs, further increasing plant species richness.

Feature Measure: hours of tractor use

Scenario Unit: Acres

Scenario Typical Size: 20.0

Scenario Total Cost: $742.04

Scenario Cost/Unit: $37.10

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acres	$15.10	20	$302.00
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$46.88	6	$281.28
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	6	$158.76

Practice: 644 - Wetland Wildlife Habitat Management

Scenario: #6 - Development of Deep Micro-Topographic Features with Heavy Equipment.

Scenario Description:

This typical scenario is installed on non-forested wetlands (or open land prior to tree planting), where micro-topographic features have been removed by past farming and/or ranching cultural practices. The purpose is to increase plant species richness and diversity, create micro-habitats for invertebrates, increase water infiltration and reduce run-off. The area is plowed 2 weeks prior to excavation to kill existing vegetation and allow for proper dirt work. Then the soil is excavated with track equipment (dozer) to a depth of 6-12 inches and immediately deposited. This lowering and raising of a dozer -blade restores the original deep micro-topographic features (10' X10' depressions and mounds) common to many landscapes and landforms prior to the lands conversion to agricultural lands. This scenario it typically implemented for ecosystem restoration projects such as wetland restoration (herbaceous or prior to planting of woody species), prairie restoration and range-land restoration. It is most commonly applied to well-drained soils as the purpose is for the micro-depression to pond water for short duration (less than 7 days).

Before Situation:

Micro-topographic features have been eliminated by past conversion to agriculture and/or past cultural practices. This has resulted in the lack of micro-soil moisture gradients within the field. The opportunity for plant species richness and diversity is minimal. Water storage potential is absent. Water rapidly runs off the field after rains and snow melt, carrying nutrients, solids and surface organic materials. No micro-ponding sites are available aquatic dependent invertebrates. Vertebrate wildlife habitat is lacking diversity.

After Situation:

Deep (6" - 12" depth) micro-depressions and mounds are numerous. These varied micro-topographic features provide varied moisture gradients required for development of high plant species richness and diversity. Wildlife habitat is improved. Water conservation is increased, increasing vegetative production. Water quality is improved as the deep micro-depressions capture sediments, nutrients and manure. Over time, the micro-depressions become more nutrient rich than the micro-highs, further increasing plant species richness.

Feature Measure: Hours

Scenario Unit: Acres

Scenario Typical Size: 20.0

Scenario Total Cost: $2,164.99

Scenario Cost/Unit: $108.25

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 200 HP	928	Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included.	Hours	$190.64	6	$1,143.84
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acres	$15.10	20	$302.00
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	8	$269.12
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	1	$450.03

Practice: 644 - Wetland Wildlife Habitat Management

Scenario: #23 - Establishment of seasonal wildlife forage or cover on non-cropland

Scenario Description:

The habitat assessment identifies the need to provide seasonal forage or cover for target wildlife species or guild. This habitat need will be met through the establishment of annual plants by planting of seed. The typical scenario will occur on areas supporting perinneal herbaceous vegetaion, not currently in cropland. Due to existing dense vegetation, these area will need to be mowed 2-3 weeks prior to disking (primarily disking), then followed by a light disking. Seed bed preparation will be furthered by firming the seed bed by cultipacking the site. Mixed fertilizer is required to establish planted wildlife forage. A seedmix consisting of annuals is typical for this activity.

Before Situation:

The existing habitat has an excess of herbaceous perineal habitat suitable for cover, but is lacking high quality forage seasonal forage, or the cover conditions is too thick and establishement of annuals create a diverse cover condition for the target wildlife species.

After Situation:

The availability of high-quality seasonal forage for the target wildlife species is provided and target wildlife health is improved, and populations are increased.

Feature Measure: acre

Scenario Unit: Acres

Scenario Typical Size: 10.0

Scenario Total Cost: $1,412.30

Scenario Cost/Unit: $141.23

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hours	$46.50	3	$139.50
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	20	$197.80
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acres	$15.10	10	$151.00
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.12	10	$61.20
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	10	$203.10
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acres	$8.00	10	$80.00
Materials						
Nitrogen (N), Ammonium Sulfate	70	Price per pound of N supplied by Ammonium Sulfate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.80	60	$48.00
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.52	60	$31.20
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.35	60	$21.00
Annual Grasses, Legumes or Forbs	2732	A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$47.95	10	$479.50

Practice: 644 - Wetland Wildlife Habitat Management

Scenario: #24 - Establishment of annuals for wildlife on cropland, without FI

Scenario Description:

The habitat assessment identified the need to provide seasonal forage or cover for target wildlife species or guild. This identified habitat need will be met through the establishment of annual vegetation by planting of seed. This typical scenario is that this activity will occur on cropland, but outside of the normal cropping season. Thus, income will not be foregone. Seed bed preparation will be furthered by firming the seed bed by cultipacking the site. The only fertilizer need is N as this is cropland and P and K levels are sufficient.

Before Situation:

Cropland that fails to provide adequate wildlife habitat (forage and/or cover) seasonnally for the target wildlife species..

After Situation:

The availability of high-quality seasonal forage for the target wildlife species is provided and target wildlife health and populations are increased.

Feature Measure: acre

Scenario Unit: Acres

Scenario Typical Size: 10.0

Scenario Total Cost: $970.70

Scenario Cost/Unit: $97.07

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	10	$98.90
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.12	10	$61.20
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	10	$203.10
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acres	$8.00	10	$80.00
Materials						
Nitrogen (N), Ammonium Sulfate	70	Price per pound of N supplied by Ammonium Sulfate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.80	60	$48.00
Annual Grasses, Legumes or Forbs	2732	A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$47.95	10	$479.50

Practice: 644 - Wetland Wildlife Habitat Management

Scenario: #25 - Establishment of annual vegetation on cropland, with FI

Scenario Description:

The typical scenario is applied on cropped wetlands (cropland). The habitat assessment identified the lack of wildlife forage or cover during the same season of year as crops are grown. In response to the need to provide wetland dependent wildlife needed forage or cover during the cropping season, annual wildlife forages will be planted on cropland for one year, in lieu of the traditional cash crop. Seedbed preparation is limited to one light disking and cultipacking. The only fertilizer need is a light application of N as cropland P and K levels are sufficient. These wildlife forages and/or seasonal cover are planted in lieu of the cash crop, such as a corn and soybean rotation. Thus, income from the traditional cash crop will be foregone for the year.

Before Situation:

The existing habitat is cropland, lacking high quality forage for cover during the cropping season.

After Situation:

Annual wildlife forages are planted in lieu of a cash crop. Target wildlife health is improved and local populations are increased.

Feature Measure: acre

Scenario Unit: Acres

Scenario Typical Size: 10.0

Scenario Total Cost: $3,272.30

Scenario Cost/Unit: $327.23

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	10	$98.90
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.12	10	$61.20
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	10	$203.10
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acres	$8.00	10	$80.00
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$215.46	5	$1,077.30
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$248.06	5	$1,240.30
Materials						
Nitrogen (N), Ammonium Sulfate	70	Price per pound of N supplied by Ammonium Sulfate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.80	40	$32.00
Annual Grasses, Legumes or Forbs	2732	A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$47.95	10	$479.50

Practice: 645 - Upland Wildlife Habitat Management

Scenario: #1 - Monitoring and Mgmt, Low Intensity, no FI

Scenario Description:

Setting is grazinglands with the potential to provide upland wildlife habitat and that potential is not currently being captured. The identified upland wildlife habitat limiting factors can be restored, enhanced or created, with the application of this practice alone, or in combination with other supporting and facilitating practices. Monitoring will be used to determine if the conservation system meets or exceeds the minimum quality criteria for the targeted wildlife. Management will be implemented based on the findings of the habitat assessment and monitoring. Upland wildlife habitat management and monitoring needed to treat the resource concerns requires no training, no qualitative data assessment, no water quality monitoring and is low in complexity and intensity. Examples of prescribed monitoring, include but are not limited to: photo points taken, use documentation by livestock, regeneration/breeding success, completing an annual management records log, documenting wildlife sightings, documenting location and species of invasive plants and condition of vegetative and structural treatments. No decision or treatment associated with this practice or facilitating practices will require income foregone. The planner will specify locations and identify the methods to the customer who will implement the monitoring and management plan. Facilitating practices may include but not limited to: 314, 315, 327, 342, 380, 384, 390, 391, 422, 472, 490, 511, 528, 550, 612, 647, 650, 654, 660, 666.

Before Situation:

Existing degraded plant conditions and resulting inadequate habitat for fish and wildlife have resulting in low use of the area by target and associated upland wildlife species.

After Situation:

Based on the results of a State-approved upland wildlife habitat assessment process, the application of upland wildlife habitat management efforts and prescribed monitoring have been implemented. With the application of this practice alone, or in combination with other supporting and facilitating practices, the inadequate upland wildlife habitat conditions have addressed. Monitoring has maximized the benefits of the needed upland wildlife habitat treatment efforts.

Feature Measure: Acres Managed and Monitored

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $638.46

Scenario Cost/Unit: $6.38

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.59	1	$6.59
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	6	$133.74
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	6	$145.14
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	3	$333.63
Materials						
Miscellaneous, containers, traps, etc.	298	Pheromone Traps, Culture container with lid. Includes materials and shipping only.	Each	$4.84	4	$19.36

Practice: 645 - Upland Wildlife Habitat Management

Scenario: #2 - Monitoring and Mgmt, Medium Intensity with FI

Scenario Description:

Setting is grazinglands with the potential to provide upland wildlife habitat and that potential is not currently being captured. The identified upland wildlife habitat limiting factors can be restored, enhanced or created, with the application of this practice alone, or in combination with other supporting and facilitating practices. Monitoring will be used to collect information/data that will result in adaptive management adoption. Upland wildlife habitat management and monitoring needed to treat the resource concerns may require training, no qualitative data assessment, no water quality monitoring and is medium in complexity and intensity. Examples of monitoring, include but are not limited to: photo points taken, use documentation by livestock, regeneration/breeding success, completing an annual management records log, documenting wildlife sightings, documenting location and species of invasive plants and condition of vegetative and structural treatments. Decisions or treatments associated with this practice or facilitating practices will require income foregone due to the deferment of livestock. The planner will specify locations and identify the methods to the customer who will implement the monitoring and management plan. Facilitating practices may include but not limited to: 314, 315, 327, 342, 380, 384, 390, 391, 422, 472, 490, 511, 528, 550, 612, 647, 650, 654, 660, 666.

Before Situation:

Existing degraded plant conditions and resulting inadequate habitat for fish and wildlife have resulting in low use of the area by target and associated upland wildlife species.

After Situation:

Based on the results of a State-approved upland wildlife habitat assessment process, the application of upland wildlife habitat management efforts and prescribed monitoring have been implemented. With the application of this practice alone, or in combination with other supporting and facilitating practices, the inadequate upland wildlife habitat conditions have addressed. Monitoring has maximized the benefits of the needed upland wildlife habitat treatment efforts.

Feature Measure: Acres Managed and Monitored.

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $2,192.11

Scenario Cost/Unit: $21.92

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$109.25	1	$109.25
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.59	6	$39.54
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	6	$133.74
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$18.46	50	$923.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	12	$290.28
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	6	$667.26
Materials						
Miscellaneous, containers, traps, etc.	298	Pheromone Traps, Culture container with lid. Includes materials and shipping only.	Each	$4.84	6	$29.04

Practice: 645 - Upland Wildlife Habitat Management

Scenario: #3 - Monitoring and Mgmt, High Intensity with FI

Scenario Description:

Setting is grazinglands with the potential to provide upland wildlife habitat and that potential is not currently being captured. The identified upland wildlife habitat limiting factors can be restored, enhanced or created, with the application of this practice alone, or in combination with other supporting and facilitating practices. Monitoring will be used to determine if the conservation system meets or exceeds the minimum quality criteria for the targeted wildlife. Management will be implemented based on the findings of the habitat assessment and monitoring. Upland wildlife habitat management and monitoring needed to treat the resource concerns may require training, qualitative data assessment, water quality monitoring and is high in complexity and intensity. Examples of prescribed monitoring, include but are not limited to: qualitative data assessment or water quality monitoring, photo points taken, use documentation by livestock, regeneration/breeding success, completing an annual management records log, documenting wildlife sightings, documenting location and species of invasive plants and condition of vegetative and structural treatments. Decisions or treatments associated with this practice or facilitating practices will require income foregone. The planner will specify locations and identify the methods to the customer who will implement the monitoring and management plan. Facilitating practices may include but not limited to: 314, 315, 327, 342, 380, 384, 390, 391, 422, 472, 490, 511, 528, 550, 612, 647, 650, 654, 660, 666.

Before Situation:

Existing degraded plant conditions and resulting inadequate habitat for fish and wildlife have resulting in low use of the area by target and associated upland wildlife species.

After Situation:

Based on the results of a State-approved upland wildlife habitat assessment process, the application of upland wildlife habitat management efforts and prescribed monitoring have been implemented. With the application of this practice alone, or in combination with other supporting and facilitating practices, the inadequate upland wildlife habitat conditions have addressed. Monitoring has maximized the benefits of the needed upland wildlife habitat treatment efforts.

Feature Measure: Acres Managed and Monitored.

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $3,323.66

Scenario Cost/Unit: $33.24

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$109.25	2	$218.50
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.59	8	$52.72
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	8	$178.32
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$18.46	50	$923.00
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	8	$272.96
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	16	$387.04
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	8	$362.72
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	8	$889.68
Materials						
Miscellaneous, containers, traps, etc.	298	Pheromone Traps, Culture container with lid. Includes materials and shipping only.	Each	$4.84	8	$38.72

Practice: 645 - Upland Wildlife Habitat Management

Scenario: #4 - Monitoring and Management, Low Intensity with Foregone Income

Scenario Description:

Setting is a grazinglands with the potential to provide habitat for species of plants and animals identified as Rare and Declining and the habitat potential is not currently being captured. The identified habitat limiting factors can be restored, enhanced or created, with the application of this practice alone, or in combination with other supporting and facilitating practices. Monitoring will be used to determine if the conservation system meets or exceeds the minimum quality criteria for the targeted wildlife. Management will be implemented based on the findings of the habitat assessment and monitoring. Habitat management and monitoring needed to treat the resource concerns requires no training, no qualitative data assessment, no water quality monitoring and is low in complexity and intensity. Examples of prescribed monitoring, include but are not limited to: photo points taken, use documentation by livestock, regeneration/breeding success, completing an annual management records log, documenting wildlife sightings, documenting location and species of invasive plants and condition of vegetative and structural treatments. No decision or treatment associated with this practice or facilitating practices will require income foregone. The planner will specify locations and identify the methods to the customer who will implement the monitoring and management plan.

Before Situation:

Existing degraded plant conditions and resulting inadequate habitat for fish and wildlife have resulted in low use of the area by target species identified as Rare and Declining and associated species.

After Situation:

Based on the results of a State-approved upland wildlife habitat assessment process, the application of habitat management efforts and prescribed monitoring have been implemented. With the application of this practice alone, or in combination with other supporting and facilitating practices, the inadequate habitat conditions have been addressed. Monitoring has maximized the benefits of the needed habitat treatment efforts.

Feature Measure: Acres Managed and Monitored.

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $1,137.96

Scenario Cost/Unit: $11.38

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	4	$89.16
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$18.46	50	$923.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	4	$96.76
Materials						
Miscellaneous, containers, traps, etc.	298	Pheromone Traps, Culture container with lid. Includes materials and shipping only.	Each	$4.84	6	$29.04

Practice: 645 - Upland Wildlife Habitat Management

Scenario: #285 - Establishment of seasonal wildlife forage or cover on cropland, no FI

Scenario Description:

This typical scenario occurs on cropland. The habitat assessment identifed the need to provide seasonal forage or cover for target wildlife species or guild. This habitat need will be met through the establishment of annual food plants or cover plants by planting of seed. The typical scenario for seasonal forage or cover will be established outside of crop season, thus FI is not needed. Seedbed preparation (light tilliage) will be furthered by firming the seed bed by cultipacking the site. The only fertilizer need is N as this is cropland and P and K levels are sufficient. Cropland, so mobilization of equipment not needed.

Before Situation:

Cropland that fails to provided food or cover for target species at the proper location and season to meet the needs of wildlife.

After Situation:

The availability of high-quality seasonal forage or seasonal cover for the target wildlife species is provided. Target wildlife health is improved and populations are increased.

Feature Measure: acre

Scenario Unit: Acres

Scenario Typical Size: 10.0

Scenario Total Cost: $970.70

Scenario Cost/Unit: $97.07

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	10	$98.90
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.12	10	$61.20
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	10	$203.10
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acres	$8.00	10	$80.00
Materials						
Nitrogen (N), Ammonium Sulfate	70	Price per pound of N supplied by Ammonium Sulfate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.80	60	$48.00
Annual Grasses, Legumes or Forbs	2732	A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$47.95	10	$479.50

Practice: 645 - Upland Wildlife Habitat Management

Scenario: #286 - Establishment of seasonal forage or cover for wildlife on cropland, with FI

Scenario Description:

The habitat assessment identified the need to provide seasonal forage or cover for target wildlife species or guild. This habitat needs will be met through the establishment of annuals by planting of seed. The typical scenario is for cropland. Seed bed preparation is limited to one light disking, furthered by firming the seed bed by cultipacking the site. The only fertilizer need is N as this is cropland and P and K levels are sufficient. These wildlife forages or seasonal cover will be be available for wildlife during the cropping seasion, and are in lieu of the cash crops typically planted on the field. Thus, income from the cash crop will be foregone for a year.

Before Situation:

Cropland does not provide forage or cover needed for wildlife during the season on dearth.

After Situation:

Annual wildlife forages are planted in lieu of a cash crop. Target wildlife health is improved and populations are increased.

Feature Measure: acre

Scenario Unit: Acres

Scenario Typical Size: 10.0

Scenario Total Cost: $3,208.30

Scenario Cost/Unit: $320.83

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	10	$98.90
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.12	10	$61.20
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	10	$203.10
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$215.46	5	$1,077.30
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$248.06	5	$1,240.30
Materials						
Nitrogen (N), Ammonium Sulfate	70	Price per pound of N supplied by Ammonium Sulfate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.80	60	$48.00
Annual Grasses, Legumes or Forbs	2732	A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$47.95	10	$479.50

Practice: 645 - Upland Wildlife Habitat Management

Scenario: #287 - Establishment of seasonal forage or cover for wildlife on non-cropland.

Scenario Description:

The habitat assessment identifies the need to provide seasonal forage or cover for target wildlife species or guild. This habitat need will be met through the establishment of annual plants by planting of seed. The typical scenario is that this activity will occur on herbaceous areas, not currently in cropland. Due to existing dense vegetation, these area will need to be mowed 2-3 weeks prior to disking (primarily disking), then followed by a light disking. Seed bed preparation will be furthered by firming the seed bed by cultipacking the site. Mixed fertilizer is required to establish planted wildlife seasonal forage or seasonal cover..

Before Situation:

The existing habitat has an excess of herbaceous perineal habitat, but is lacking high-quality seasonal forage, or the existing cover is too dense and cover conditions found in annual plant communities are absent.

After Situation:

The availability of high-quality seasonal forage, or cover condition common in annual plant communities is provided and target wildlife health and populations are increased.

Feature Measure: acre

Scenario Unit: Acres

Scenario Typical Size: 10.0

Scenario Total Cost: $1,444.30

Scenario Cost/Unit: $144.43

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hours	$46.50	3	$139.50
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	20	$197.80
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acres	$15.10	10	$151.00
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.12	10	$61.20
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	10	$203.10
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acres	$8.00	10	$80.00
Materials						
Nitrogen (N), Ammonium Sulfate	70	Price per pound of N supplied by Ammonium Sulfate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.80	100	$80.00
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.52	60	$31.20
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.35	60	$21.00
Annual Grasses, Legumes or Forbs	2732	A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$47.95	10	$479.50

Practice: 646 - Shallow Water Development and Management

Scenario: #1 - Shallow Water Management

Scenario Description:

This scenario addresses inadequate habitat for fish and wildlife on cropland. The resource concern is addressed by providing shallow water habitat for wildlife such as shorebirds, waterfowl, wading birds, mammals, fish, reptiles, amphibians, and other species that require shallow water for at least part of their life cycle. Sites are flooded up to a depth of 18" with an average depth of 9". Water is provided by natural flooding and/or precipitation.

Before Situation:

There is inadequate habitat to provide optimum resting, nesting, and feeding habitat for waterfowl, shorebirds, and other wildlife (amphibians, reptiles, mammals, invertebrates, etc.).

After Situation:

A single or series of shallow water areas that are managed per standard and specification. Water levels are regulated to maintain temporary wildlife habitat. Timing and duration of flooding and de-watering is dependent on specific species requirements. Water is pumped into area to be flooded. Flooded sites vary from mudflats to water depths of 18" with an average depth of 9". The hydrologic conditions of ponding and saturation (frequency, depth, duration, timing) provides optimum seasonal habitat for waterfowl, shorebirds, and other wildlife (amphibians, reptiles, mammals, invertebrates, etc.). If needed and dikes or water control structures are not currently present on the fields planned to be flooded, these practices may be planned for the same fields and cost shared under Structure for Water Control (587) and Dike (356). If a natural water source (i.e. precipitation or flooding) is not available, Pumping Plant (533) may be cost shared to provide a water source. Depending on local conditions, other Conservation Practices may also be required.

Feature Measure: Acre of shallow water

Scenario Unit: Acres

Scenario Typical Size: 1.0

Scenario Total Cost: $133.44

Scenario Cost/Unit: $133.44

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$109.25	1	$109.25
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	1	$24.19

Practice: 646 - Shallow Water Development and Management

Scenario: #2 - Shallow Water Management, High Level

Scenario Description:

This scenario addresses inadequate habitat for fish and wildlife on cropland. To facilitate practice code 643, 644, 645, or 395, seasonal shallow water is provided annually for target species by purchasing of water, lifting of such water, monitoring of the water quality, response by target plant community, use by target flora or fauna. Sites are flooded up to a depth of 18"with an average depth of 9". Monitoring and adaptive management accomplished of existing water control structures is accomplished to meet very specific conditions needed to address previously identified degraded plant conditions or inadequate habitat for fish and/or wildlife. This high-level managmenet is applied to lands used for crop, pasture, hay, forests or wildlife lands where target flora and fauna have been identified as a primary concern. Loss of some level of crop, forage, hay or forest products may occur depending on site specific conditions.

Before Situation:

The site has existing infrastructure (reliable water source, dikes, water control structures, pumps, gates) to provide a reliable seasonal water source. The site is not subject to frequent natural flooding. The potential benefits to target fauna and flora is not being captured. The purchase of water, supply of water and intensive managment of season water, coupled with monitoring, adaptive managment from highly trained individuals will fully address the identifed degraded plant conditions and/or inadequate habitat for fish and/or wildlife.

After Situation:

A single or series of shallow water areas that are managed per standard and specification. Water levels are regulated to maintain temporary wildlife habitat. Timing and duration of flooding and de-watering is dependent on specific species requirements. Water is pumped into area to be flooded. Flooded sites vary from mudflats to water depths of 18" with an average depth of 9". The hydrologic conditions of ponding and saturation (frequency, depth, duration, timing) provides optimum seasonal habitat for waterfowl, shorebirds, and other wildlife (amphibians, reptiles, mammals, invertebrates, etc.). If Dikes or Water Control Structures are not currently present on the fields planned to be flooded, these practices may be planned for the same fields and cost shared under Structure for Water Control (587) and Dike (356). If a natural water source (i.e. precipitation or flooding) is not available, Pumping Plant (533) may be cost shared to provide a water source. Depending on local conditions, other Conservation Practices may also be required.

Feature Measure: Acre of shallow water

Scenario Unit: Acres

Scenario Typical Size: 1.0

Scenario Total Cost: $260.22

Scenario Cost/Unit: $260.22

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$109.25	1	$109.25
Equipment Installation						
Water management, Flooding & dewatering	969	Includes equipment and power unit. Labor not included.	Acre Feet	$169.04	0.75	$126.78
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	1	$24.19

Practice: 647 - Early Successional Habitat Development-Mgt

Scenario: #1 - Mowing

Scenario Description:

This scenario address inadequate habitat for fish and wildlife where setting back succession by mowing incoming woody species will improve habitat for the target species. Mowing can be used to increase structural diversity by creating areas of shorter vegetation prefered by some species or certain life stages of species. This scenario can be used nationwide. The typical setting for this scenario is at the edge of crop fields, in pastures, at the edge of woodlands or brushy areas, and in odd areas such as pivot corners. Where the management of woody plants is require to create or maintain early successional habitat conservation practice 314 brush management or 666 forest stand improvement should be used. Where chemical control of weeds, including invasives, is required to reduce competition for the desired plant community conservation practice 315 herbaceous weed control should be used. Where the seedbank is inadequate for natural regeneration and seeding is required use conservation practice 550 range seeding or 327 Conservation Cover. Where the need is to create early successional habitat within or at the edge of woodland or forest use conservation practice 666 forest stand improvement to remove trees.

Before Situation:

The site is static or trending to later successional plant community. The disturbance regeme to maintain an earlier successional plant community is lacking. Pastures are often monotypic, lacking in diversity. Competition for sunlight from dense grass stands prevents seedling establishment. Stands are often dense and inhibit the movements of young wildlife such as game bird chicks. Area lacks diversity in the height of vegetation.

After Situation:

Early successsional habitat maintained. Mowing has provided more sun light for forb establishment. The heterogeneity of the habitat structure has been increased.

Feature Measure: width and length of treated area

Scenario Unit: Acres

Scenario Typical Size: 2.0

Scenario Total Cost: $450.37

Scenario Cost/Unit: $225.19

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hours	$46.50	4	$186.00
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	4	$105.84
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53

Practice: 647 - Early Successional Habitat Development-Mgt

Scenario: #2 - Disking

Scenario Description:

This practice addresses inadequate wildlife habitat for species requiring early successional habitat. This scenario provides early successional habitat by setting back succession and manipulating species composition by disking vegetation and creating bare ground. The typical setting for this scenario is at the edge of crop fields, in pastures, and in odd areas such as pivot corners. This scenario is applicable nationwide. Where the management of woody plants is require to create or maintain early successional habitat conservation practice 314 brush management or 666 forest stand improvement should be used. Where chemical control of weeds, including invasives, is required to reduce competition for the desired plant community conservation practice 315 herbaceous weed control should be used. Where the seedbank is inadequate for natural regeneration and seeding is required, use conservation practice 550 range seeding or 327 Conservation Cover. Where the need is to create early successional habitat within or at the edge of woodland or forest use conservation practice 666 forest stand improvement to remove trees.

Before Situation:

The site is static or trending to higher successional plant species. The disturbance regeme to maintain a lower successional stage is lacking. Pastures are often monotypic, lacking in diversity. Bare ground for seedling establishment is absent. Stands are often dense and inhibit the movements of younger wildlife species suchh as game bird chicks.

After Situation:

The application of this scenario improves wildlife habitat for species requiring early successional plant communities by reducing competition and creating bare ground for the establishment of early successional plants. Additionally, brood rearing habitat is improved both by the resultant food resources and the increased openess of the plant community that allows chicks to negotiate the terrain and exploit those food resources.

Feature Measure: width and length of treated area

Scenario Unit: Acres

Scenario Typical Size: 2.0

Scenario Total Cost: $178.31

Scenario Cost/Unit: $89.16

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	2	$19.78
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53

Practice: 649 - Structures for Wildlife

Scenario: #1 - Nesting Box, Small no pole

Scenario Description:

A structure is provided to support the nesting and rearing of smaller targeted species, such as bees and birds, and is directly mounted to a tree, building or other structure. Addresses resource concern for wildlife of inadequate cover/shelter

Before Situation:

The area lacks sufficient nesting habitat sites (natural cavities). A suitable location to mount the box is available.

After Situation:

The installation of nesting and rearing boxes support the life-cycle needs of targeted speces, such as birds, bats and pollinators. These structures/features enhance habitat, cover, and improve species survivability.

Feature Measure: Number of structures

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $41.96

Scenario Cost/Unit: $41.96

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	0.5	$12.10
Materials						
Habitat Box, Bird	251	Bluebird nesting box to increase nesting success. Each is 1-1/2 x 6 x 12-1/2 Inch with a 1-1/2 inch diameter opening. Includes materials and shipping.	Each	$29.86	1	$29.86

Practice: 649 - Structures for Wildlife

Scenario: #2 - Nesting Box, Small, with wood pole

Scenario Description:

Constructing a nest box and mounting on a pole. A structure is provided to support the nesting and rearing of targeted species, such as pollinators and birds. Trees, buildings or other structures are not available. These structures are designed to meet targeted species biology and life history needs. Addresses Resource Concern: Inadequate Cover/Shelter.

Before Situation:

This area lacked sufficient nesting sites to support viable populations of targeted species. Location and conditions suggest that predator guards are not needed.

After Situation:

The installation nesting and rearing boxes support the life-cycle needs of targeted speces, such as blue birds and waterfowl. Location and conditions suggest that predator guards are not needed. These structures/features enhance habitat, cover, and improve species survivability.

Feature Measure: Number of structures with poles.

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $65.21

Scenario Cost/Unit: $65.21

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	0.75	$18.14
Materials						
Post, Wood, CCA treated, 6 in. x 8 ft.	12	Wood Post, End 6 inch dia. X 8 ft., CCA Treated. Includes materials and shipping only.	Each	$17.21	1	$17.21
Habitat Box, Bird	251	Bluebird nesting box to increase nesting success. Each is 1-1/2 x 6 x 12-1/2 Inch with a 1-1/2 inch diameter opening. Includes materials and shipping.	Each	$29.86	1	$29.86

Practice: 649 - Structures for Wildlife

Scenario: #3 - Nesting Box, Large

Scenario Description:

A structure is provided to support the nesting and rearing of larger targeted species such as waterfowl, bats and barn owls, and is directly mounted to a tree, building or other structure. These structures are designed to meet targeted species biology and life history needs. Addresses Resource Concern: Inadequate Cover/Shelter.

Before Situation:

The area lacks sufficient overall habitat conditions to support viable populations of targeted species. A suitable location to mount the box is available. Predator guards not needed.

After Situation:

The installation of nesting and rearing boxes support the life-cycle needs of targeted species, such as birds, bats and pollinators. Because of suitable location and conditions the nesting box can be directly mounted such as on a tree or building, thereby eliminating the need for mounting poles and predator guards. Species such as cavity dwelling birds and pollinators use this approach, but this treatment is not limited to those species. These structures/features enhance habitat, cover, and improve species survivability.

Feature Measure: Number of structures.

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $92.87

Scenario Cost/Unit: $92.87

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	0.5	$12.10
Materials						
Habitat Box, waterfowl	1449	Wood Duck Box, typically 24x11x12 inch with 4 inch wide oval entrance, single. Includes material and shipping only.	Each	$80.77	1	$80.77

Practice: 649 - Structures for Wildlife

Scenario: #4 - Nesting Box or Raptor Perch, Large, with Pole

Scenario Description:

Constructing a nest box or rapture perch on a steel pole with a predator guard where needed. A structure is provided to support the nesting and rearing of larger targeted species such as woodducks, bats, barn owls or to provide needed perches or nesting structures for raptures. Addresses Resource Concern: Inadequate Cover/Shelter.

Before Situation:

The area lacks sufficient overall nesting sites to support viable populations of targeted species. Predator guards provide needed protection of target species during nesting and rearing.

After Situation:

The installation of pole mounted nesting and rearing boxes support the life-cycle needs of targeted species, such as bats and waterfowl.

Feature Measure: Number of structures

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $395.69

Scenario Cost/Unit: $395.69

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formless, non reinforced	36	Non reinforced concrete cast-in-placed without forms by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$184.90	0.1	$18.49
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$19.49	0.5	$9.75
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	1.5	$36.29
Materials						
Pipe, steel, galvanized, threaded, 1 1/4 inch, schedule 40	256	Spec. A-53, includes coupling and clevis hanger assembly sized for covering, 10' OC	Feet	$21.40	10	$214.00
Habitat Box, waterfowl	1449	Wood Duck Box, typically 24x11x12 inch with 4 inch wide oval entrance, single. Includes material and shipping only.	Each	$80.77	1	$80.77
Predator Guard	1461	Predator guards (i.e. stove pipes, cone, hole guard, etc.) for habitat boxes. Materials only. Includes material and shipping only.	Each	$36.40	1	$36.40

Practice: 649 - Structures for Wildlife

Scenario: #5 - Escape Ramp

Scenario Description:

Retrofit an existing watering trough/tank with an appropriately designed and installed wildlife escape ramp to reduce wildlife mortality and maintain water quality within the watering facility.

Before Situation:

Existing watering facilities lack escape potential for wildlife. This results in death of the small wildlife accessing the facility for water, and resulting poor water quality as the animal decays.

After Situation:

Watering facilities provide wildlife safe access. Water quality is improved within the watering facility and wildlife mortality is reduced.

Feature Measure: Each Ramp

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $75.11

Scenario Cost/Unit: $75.11

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	0.5	$12.10
Materials						
Wildlife Escape Ramp	242	Pool size 15' x 30', for small mammals less than one pound	Each	$63.01	1	$63.01

Practice: 649 - Structures for Wildlife

Scenario: #6 - Fence Markers, Vinyl Undersill

Scenario Description:

Existing fences are retrofitted with vinyl markers that increase wire visibility and reduce mortality due to collision for wildlife species of concern. Markers are installed approximately every 3 feet along top wire. Scenario is typically implemented along fences in potential high risk areas (red areas in SGI Fence Collision Risk Model) or where a known problem exists.

Before Situation:

Wire fences located in high risk areas pose a collision threat to wildlife of special concern.

After Situation:

Fence related mortality of species of special concern is reduced.

Feature Measure: feet of fence marked

Scenario Unit: Feet

Scenario Typical Size: 1,320.0

Scenario Total Cost: $223.10

Scenario Cost/Unit: $0.17

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$19.49	0.5	$9.75
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	5	$120.95
Materials						
Vinyl Undersill Strips	241	Marking material using the undersill strips of vinyl siding. Priced per foot of fence per each wire. Materials only.	Feet	$0.07	1320	$92.40

Practice: 649 - Structures for Wildlife

Scenario: #7 - Brush Pile - Small

Scenario Description:
Small brush piles are created to provide shrubby/woody escape cover for wildlife. Pushing or cutting of select small trees and placement in selected locations to provide wildlife cover. Typical scenario of 10' x 20' area for structure covered by interlocking limbs of trees less than 12 inches in diameter.

Before Situation:
The existing habitat lacks escape, ground nesting and safe loafing cover.

After Situation:
Small brush piles provide needed escape, ground nesting and safe loafing cover for targeted wildlife species.

Feature Measure: brush piles

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $38.59

Scenario Cost/Unit: $38.59

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.72	0.5	$25.36
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	0.5	$13.23

Practice: 649 - Structures for Wildlife

Scenario: #8 - Brush Pile - Large

Scenario Description:

Downed tree structures are created to provide shrubby/woody escape cover for wildlife. Existing sod will be killed prior to placement of tree structures. Felling of select trees and placement in selected locations to provide wildlife cover. Typical scenario of 30' x 50' area for structure covered by interlocking limbs of trees at least 12" in diameter.

Before Situation:

The existing habitat lacks escape, ground nesting and safe loafing cover.

After Situation:

Large brush piles provide needed escape, ground nesting and safe loafing cover for targeted wildlife species.

Feature Measure: brush piles

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $156.34

Scenario Cost/Unit: $156.34

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.72	1	$50.72
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.59	1	$6.59
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	3	$72.57
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	1	$26.46

Practice: 649 - Structures for Wildlife

Scenario: #9 - Raptor Perch Pole

Scenario Description:

A structure is provided to improve wildlife habitat by providing a raptor perch. These structures are designed to meet targeted species biology and life history needs. Poles are typically 12 to 15 feet above the ground surface, and buried 3 ft or more.

Before Situation:

These structures are targeted for areas that lack sufficient overall habitat conditions to support viable populations of targeted species. Insufficient perch locations are available.

After Situation:

The installation of a raptor perch pole enhances the overall habitat needs of targeted species. These structures/features enhance habitat and improve species survivability.

Feature Measure: Number

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $487.24

Scenario Cost/Unit: $487.24

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	1	$24.19
Materials						
Pipe, steel, galvanized, threaded, 2 inch, schedule 40	257	Spec. A-53, includes coupling and clevis hanger assembly sized for covering, 10' OC	Feet	$25.05	18	$450.90
Concrete mix, bag	1226	Pre-mixed dry concrete mix in 60 pound bag. Materials only.	Each	$4.05	3	$12.15

Practice: 649 - Structures for Wildlife

Scenario: #10 - Burrowing Owl Burrow

Scenario Description:

A structure is provided to improve wildlife habitat by providing a burrowing owl burrow. These structures are designed to meet targeted species biology and life history needs. Two nesting locations are provided per site. Each nesting site has two points of access. The two nest locations may also be connected.

Before Situation:

These structures are targeted for areas that lack sufficient overall habitat conditions to support viable populations of targeted species. Insufficient natural burrow locations are available.

After Situation:

The installation of a burrowing owl burrow enhances the overall habitat needs of targeted species. These structures/features enhance habitat and improve species survivability.

Feature Measure: Number

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $356.14

Scenario Cost/Unit: $356.14

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$29.47	2	$58.94
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	2	$48.38
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	2	$52.92
Materials						
Pipe, PVC, 6 in., SCH 40	980	Materials: - 6 inch - PVC - SCH 40 - ASTM D1785	Feet	$6.58	24	$157.92
Pipe, HDPE, 4 in., PCPT, Single Wall	1270	Pipe, Corrugated Plastic Tubing, Single Wall, Perforated, 4 inch diameter - ASTM F405. Material cost only.	Feet	$0.52	60	$31.20
Bucket, 5 gal	1758	5 gallon plastic bucket. Materials only.	Each	$3.39	2	$6.78

Practice: 649 - Structures for Wildlife

Scenario: #11 - Lunkers

Scenario Description:

A structure is provided to improve aquatic habitat by providing alternative cover when natural cover is not readily available. These structures are designed to enhance habitat by simulating an overhanging/undercut bank. The resulting cavity provides cover and temperature attenuation to support aquatic organism biology and life history needs. A structure made of wood is placed at the toe of a slope on a rock base. The structure is then weighted with rock and covered.

Before Situation:

These structures are targeted for areas that lack sufficient cover and overall habitat conditions to support the life cycle needs of numerous aquatic organisms.

After Situation:

The installation of lunkers, typically in groups of three, provide improved cover. These structures improve species survivability by providing cover and temperature attenuation. Typical installation is a group of three lunkers that are typically 8 ft long and 2 ft wide. Structures are typically located downstream of the apex of a bend to promote flow through the structure and minimize depostion of sediments.

Feature Measure: Number

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $3,280.98

Scenario Cost/Unit: $3,280.98

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$100.83	8	$806.64
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	16	$387.04
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	16	$538.24
Materials						
Rock Riprap, graded, angular, material and shipping	1200	Graded Rock Riprap for all gradation ranges. Includes materials and delivery only.	Ton	$31.63	22	$695.86
Lumber, planks, posts and timbers, untreated, rot resistant	1612	Untreated dimension lumber with nominal thickness greater than 2" milled from rot resistant species such as cedar. Includes lumber and fasteners. Does not include labor.	Board Feet	$3.16	270	$853.20

Practice: 649 - Structures for Wildlife

Scenario: #12 - Brush and Rock Piles

Scenario Description:

A brush pile or rock pile provides improved wildlife habitat by providing resting and escape cover. These structures are located and constructed to meet targeted species biology and life history needs. While size varies, brush piles are typically 10 ft in diameter and 6 ft high at the center. Multiples brush piles are better than one larger pile, and two to four piles per acre of area adjacent to woodlands is desirable. Piles are typically 200 to 300 ft apart. Stumps, logs, rocks and pipes are typically placed at the bottom with limbs and leaves placed on top, thereby allowing easy access to the bottom of the pile. These piles can provide nesting habitat, resting areas, concealment, and protection from some predators for birds, rabbits, and other small mammals. Rock piles provide shelter and basking areas for amphibians and reptiles such as frogs, lizards, salamanders and snakes. Large rocks are typically placed at the bottom. Often depressions are dug in the ground surface and covered with flat rocks to create temporary pools for breeding frogs and salamanders. Rocks absorb heat in the day and radiate heat at night. Materials for brush and rock piles are collected locally.

Before Situation:

These structures are targeted for areas that lack sufficient overall habitat conditions to support viable populations of targeted species. Insufficient ground cover is available for resting, basking, and escape cover. Existing brushy cover is is lacking or not well distributed.

After Situation:

The installation of a brush piles and rock piles enhances the overall habitat needs of numerous terrestrial species. These structures/features enhance habitat and improve species survivability. By providing resting, basking, and escape cover, larger open spaces are more effectively used by ground nesting birds, amphibians, reptiles,and small mammals. Increased cover reduces predation.

Feature Measure: Number

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $30.78

Scenario Cost/Unit: $30.78

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.59	1	$6.59
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	1	$24.19

Practice: 649 - Structures for Wildlife

Scenario: #13 - Nesting Islands (set of 3)

Scenario Description:

This practice involves constructing, maintaining, and monitoring loafing structures to provide nesting/loafing cover for waterbirds, reptiles, and amphibians. This practice applies to croplands grown to rice or other flooded cropland capable of water level management. A habitat appraisal guide has identified that nesting/loafing cover is a limiting factor for shorebirds, waterbirds, waterfowl, or other wetland wildlife and where natural recovery of that habitat element is either unlikely or will take many years to naturally develop. Each island will be a minimum of 800 sqft above the waterline with slopes of between 8:1 and 10:1 with a one foot freeboard. There will be one created island per 10 acres with a minimum of three islands per project. Vegetated areas can be used for breeding waterfowl; encourage non-vegetated areas for breeding shorebirds. Resource Concern: Inadequate Habitat for Fish and Wildlife.

Before Situation:

This practice applies to croplands grown to rice or other crops capable of being managed for shallow water management objectives, where a habitat appraisal guide has identified that nesting/loafing cover is a limiting factor for shorebirds, waterbirds, waterfowl, or other wetland wildlife and where natural recovery of that habitat element is either unlikely or will take many years to naturally develop.

After Situation:

3 islands constructed to a minimum of 800 sqft above the waterline with slopes of between 8:1 and 10:1 with a one foot freeboard. There will be one created island per 10 acres. Three island minimum per project. Creating islands provides suitable nesting/ loafing areas withing the flooded agricultural fields and offsets the lack of protected uplands for nesting or loafing shorebirds, waterfowl, reptiles, and amphibians.

Feature Measure: 3 Nesting Islands

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $4,721.31

Scenario Cost/Unit: $4,721.31

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 200 HP	928	Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included.	Hours	$190.64	20	$3,812.80
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	20	$672.80
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 649 - Structures for Wildlife

Scenario: #14 - Snag Creation

Scenario Description:

Create snags from existing live trees to provide nesting, foraging, perching, thermal cover, and display habitat for target species such as cavity nesting birds (woodpeckers, songbirds, wood duck, etc), small mammals (shrew, chipmunk, flying squirrel, bats, etc.), amphibians and reptiles and bumble bees. Trees must be at least 12” DBH. Resulting snag will be a minimum of 25’ tall. Snag creation methods may include girdling, chemical injection, or high topping.

Before Situation:

These structures are targeted for areas that lack sufficient snag habitat conditions to support viable populations of targeted species. Insufficient cavity nests, foraging, and perching habitat exists on the planning unit. Existing snag habitat is lacking or not well distributed.

After Situation:

Snag creation enhances the overall habitat condition for numerous terrestrial species. These structures/features enhance habitat and improve species survivability. By providing cavity nesting sites, invertebrate foraging area, perching/hunting opportunities, and thermal cover/escape cover, larger open spaces are more effectively used by cavity nesting birds and pollinators, amphibians, reptiles,and small mammals. Increased cover reduces predation.

Feature Measure: Number of snags

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $27.49

Scenario Cost/Unit: $27.49

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.59	0.5	$3.30
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	1	$24.19

Practice: 649 - Structures for Wildlife

Scenario: #15 - Downed Large Wood-Upland

Scenario Description:

Large log is placed on the upland or riparian forest floor to provide cover, denning, thermal regulation, and/or forage sites for wildlife species such as small mammals, amphibians, and game birds. Large wood is defined as a minimum log diameter of 12" and 20 ft long lenght. Forest terrian is moderate with existing forest road infrastructure. Log sections are cut on site or hauled. Installation of downed logs deemed necessary following a Wildlife Habitat Evaulation score below planning critiera level. Primary Resouce concern is Inadequate Habitat for Fish or Wildlife-habitat degradation. This practice may be installed alone or in combination with facilitating practices. Facilitating practices may include but not limited to: 382, 391,612, 660 and 666.

Before Situation:

A habitat assessment (using State Office approved habitat assessment method, protocol or tool) has indicated a need for increased structural complexity in the forest understory to bring one or more habitat limiting factors under Inadequate Habitat for Fish or Wildlife, up to planning criteria. Upland habitat limiting factors include quality, quantity and continuity of forage, cover, shelter, space and water avalability. The structures can be installed within a quarter mile of a driveable road and terrain is gentle to moderate.

After Situation:

Installation of downed large wood brings the identified deficient habitat limiting factors up to planning criteria. The practice is installed using general labor with minimal supervision or skilled labor without supervision with use of common hand tools and small equipment;

Feature Measure: Number of stems large wood

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $283.21

Scenario Cost/Unit: $283.21

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.72	0.5	$25.36
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.59	1	$6.59
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	2	$48.38
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	1.5	$39.69
Materials						
Log, un-anchored	2035	Price of log picked up at the Mill. Includes material only.	Ton	$163.19	1	$163.19

Practice: 649 - Structures for Wildlife

Scenario: #23 - Open topped pipe capping

Scenario Description:

Closing off the top of an open vertical pipe that poses a hazard to wildlife, such as fence posts or miscellaneous irrigation structures. Typically, fences or irrigation structures have multiple open vertical pipes that require caps, for example, if fence braces are constructed from pipes, 2 or 3 caps would be needed for each fence brace (one per post).

Before Situation:

Open topped pipes create a hazard for small wildlife that get trapped inside.

After Situation:

Open topped pipes are capped to prevent wildlife hazards.

Feature Measure: each pipe

Scenario Unit: Each

Scenario Typical Size: 10.0

Scenario Total Cost: $262.20

Scenario Cost/Unit: $26.22

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$19.49	5	$97.45
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	5	$120.95
Materials						
End Cap - Pipe Steel	2652	End Cap - Cap for Steel Pipe to close open end (2 inch - 4 inch diameter) Material only	Each	$4.38	10	$43.80

Practice: 649 - Structures for Wildlife

Scenario: #24 - Beaver Dam Template Structure

Scenario Description:
Posts set in a row across the stream channel, typically in smaller streams where habitat restoration, decreased stream velocities, or aggradation of the channel bed is desired. Post spacing is about 2', intended to catch debris and serve as an anchor point for beaver to construct a dam.

Before Situation:
Stream channel is degrading and/or stream banks are eroding causing habitat degradation (both aquatic and riparian).

After Situation:
Installation of the structure causes beaver to continue to build a dam in the location, decreasing stream velocities and expanding the riparian area.

Feature Measure: linear feet

Scenario Unit: Linear Feet

Scenario Typical Size: 25.0

Scenario Total Cost: $467.10

Scenario Cost/Unit: $18.68

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$19.49	2	$38.98
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	16	$387.04
Materials						
Lumber, planks, posts and timbers, untreated, rot resistant	1612	Untreated dimension lumber with nominal thickness greater than 2" milled from rot resistant species such as cedar. Includes lumber and fasteners. Does not include labor.	Board Feet	$3.16	13	$41.08

Practice: 650 - Windbreak/Shelterbelt Renovation

Scenario: #1 - Sod Release

Scenario Description:

Reduce competition from sod around trees/shrubs within a windbreak/shelterbelt. Apply appropriate herbicide to stress or kill competing sod vegetation between and/or within tree/shrub row. A herbicide application is completed to significantly reduce competition from sod (grass) in the windbreak.

Before Situation:

1000 feet of livestock shelterbelt, 4 row mix of deciduous and conifer trees/shrubs deteriorating due to being sod bound. Resouce concerns: Degrade plant condition-undesirable plant productivity and health; Livestock Production-Inadequate livestock shelter..

After Situation:

Integrity of windbreak restored. Domestic animal protection restored.

Feature Measure: Length of Renovation

Scenario Unit: Feet

Scenario Typical Size: 5,000.0

Scenario Total Cost: $337.40

Scenario Cost/Unit: $0.07

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	1	$5.34
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	2	$48.38
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	1	$111.21
Materials						
Herbicide, Sethoxydim	339	A selective post emergence herbicide used to control annual and perennial grass weeds. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$13.94	1	$13.94
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53

Practice: 650 - Windbreak/Shelterbelt Renovation

Scenario: #4 - Renovation - Tree/shrub removal with chainsaw followed by hand planting

Scenario Description:

Windbreak/shelterbelt renovation to remove and replace deteriorated, damaged, diseased, or unsuitable trees or shrubs. The treatment may include removal of entire rows, or removal of selected trees/shrubs in order to prepare for the necessary planting of replacement trees and shrubs within the footprint of an existing windbreak, to improve the health and function of the windbreak. Supplemental plantings of bare root and/or containerized trees/shrubs, of conifer and/or deciduous species, or mixtures, are applied to improve the effectiveness and longevity of the windbreak. Windbreak width of 60' and length of 726' are used in calculations; this is equivalent to an area of 1 acre. For planting that expands the footprint of an existing windbreak, use scenarios for Windbreak/Shelterbelt Establishment. Resource concerns include: Plant pest pressure, Plant productivity and health, Inadequate livestock shelter, Wind erosion.

Before Situation:

The health of trees and/or shrubs in a windbreak/shelterbelt has degraded as plants age, or plants may have been damaged by weather events or pests, decreasing the effectiveness of the original windbreak design. Plants lack leaf cover, have dead branches, gaps with no live green material, or may be completely dead. Wind moves freely through areas that lack foliage.

After Situation:

The integrity of 726 linear feet (one acre) of windbreak/shelterbelt has been restored and is functioning properly to reduce wind impacts to plants, animals, humans, and structures.

Feature Measure: Length of Renovation

Scenario Unit: Feet

Scenario Typical Size: 726.0

Scenario Total Cost: $2,785.54

Scenario Cost/Unit: $3.84

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.59	10	$65.90
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	4	$89.16
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$11.47	18	$206.46
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	10	$341.20
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	28	$677.32
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	4	$444.84
Materials						
Shrub, Seedling, Large	1508	Bare root shrub seedling, 36 to 60 inches tall; includes tropical containerized seedlings larger than 20 cubic inches. Includes materials and shipping only.	Each	$2.82	36	$101.52
Tree, Hardwood, Seedling, Medium	1510	Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only.	Each	$1.52	36	$54.72
Tree, Conifer, Seedling, Large	1515	Containerized conifer seedlings, 15 or 20 cubic inches; or bare root conifer seedlings 2+1 (three-year old seedlings that grew two years in the original seedbed and another year in a transplant bed) or bare root seedlings 3+0 and older (three-year or older seedlings grown in their original seedbed, or transplanted seedlings). Includes materials and shipping only.	Each	$1.33	36	$47.88
Tree, Hardwood, Potted, Small	1529	Potted hardwood seedling, 1 quart to 1 gallon. Includes materials and shipping only.	Each	$7.78	36	$280.08
Tree, Conifer, Potted, Small	1534	Potted conifer seedling, 1 quart to 1 gallon. Includes materials and shipping only.	Each	$5.71	36	$205.56
Tree shelter, mesh tree tube, 24 in.	1555	24 inch tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only.	Each	$0.40	90	$36.00

Tree shelter, solid tube type, 3-1/4 in. x 30 in.	1560	3-1/4 inch x 30 inch tree tube for protection from animal damage. Materials only.	Each	$1.72	90	$154.80
Stakes, wood, 3/4 in. x 3/4 in. x 36 in.	1581	3/4 in. x 3/4 in. x 36 in. wood stakes to fasten items in place. Includes materials only.	Each	$0.77	90	$69.30
Stake, bamboo, 3/8 in. x 36 in.	1584	3/8 in. x 36 in. bamboo stakes to anchor items in place. Inlcudes materials and shipping only.	Each	$0.12	90	$10.80

Practice: 650 - Windbreak/Shelterbelt Renovation

Scenario: #5 - Removal <8 inches DBH with Skidsteer

Scenario Description:

Windbreak renovation requires the removal of degraded or inappropriate trees or shrubs within a windbreak. This may include removal of entire rows, including stumps or roots, or selected trees/shrubs in order to prepare for the necessary planting of a replacement row within the windbreak, improve the health of the remaining rows, and/or allow for supplemental planting to expand the windbreak. Resource concerns include Degraded plant condition- undesirable plant productivity and health; Livestock Production-Inadequate livestock shelter, Soil erosion-wind.

Before Situation:

Reduce wind impacts by renovating 1,000 foot windbreaks or shelterbelts using heavy equipment to remove selected trees with average DBH < 8 Inches. Typically trees and shrubs are cleared by a Skidsteer using a tree sheer or saw. All slash material from cutting and pruning is either scattered and crushed, piled and crushed, chipped or removed from the treatment area.

After Situation:

Integrity and function of windbreak restored.

Feature Measure: Length of Renovation

Scenario Unit: Feet

Scenario Typical Size: 1,000.0

Scenario Total Cost: $892.78

Scenario Cost/Unit: $0.89

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.72	8	$405.76
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	10	$264.60
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	2	$222.42

Practice: 650 - Windbreak/Shelterbelt Renovation

Scenario: #6 - Removal > 8 inches DBH with Dozer

Scenario Description:

Windbreak renovation requires the removal of degraded or inappropriate trees or shrubs within a windbreak. This may include removal of entire rows, including stumps or roots, or selected trees/shrubs in order to prepare for the necessary planting of a replacement row within the windbreak, improve the health of the remaining rows, and/or allow for supplemental planting to expand the windbreak. Resource concerns include Degraded plant condition- undesirable plant productivity and health; Livestock Production-Inadequate livestock shelter, Soil erosion-wind.

Before Situation:

Reduce wind impacts by renovating 1,000 foot windbreaks or shelterbelts using heavy equipment to remove selected trees with average DBH > 8 inches. Typically trees and shrubs are cleared by dozer (D-6 or equivalent) using a brush rake or blade. All slash material from cutting and pruning is either scattered and crushed, piled and crushed, chipped or removed from the treatment area.

After Situation:

Integrity and function of windbreak restored.

Feature Measure: Length of Renovation

Scenario Unit: Feet

Scenario Typical Size: 1,000.0

Scenario Total Cost: $1,264.74

Scenario Cost/Unit: $1.26

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$96.65	8	$773.20
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	8	$269.12
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	2	$222.42

Practice: 650 - Windbreak/Shelterbelt Renovation

Scenario: #7 - Renovation_Thinning or tree removal with Dozer (trees > 8 inches DBH) followed by hand planting

Scenario Description:

Windbreak/shelterbelt renovation to remove and replace deteriorated, damaged, diseased, or unsuitable trees or shrubs. The treatment may include removal of entire rows, or removal of selected trees/shrubs in order to prepare for the necessary planting of replacement trees and shrubs within the footprint of an existing windbreak, to improve the health and function of the windbreak. The treatment uses mechanized equipment to remove trees and/or shrubs with average DBH >8 inches. Trees and shrubs are cleared with a Dozer. All woody debris from cutting and pruning is either scattered and crushed, piled and crushed, chipped, or removed from the treatment area. Hand planting is used to replace the trees/shrubs that were removed, improving the effectiveness and longevity of the windbreak. Various types and combinations of plant materials may be used, including bare root and/or containerized trees/shrubs, and conifer and/or deciduous species or mixtures. Windbreak width of 60' and length of 726' are used in calculations; this is equivalent to an area of 1 acre. For planting that expands the footprint of an existing windbreak, use scenarios for Windbreak/Shelterbelt Establishment. Resource concerns include: Plant pest pressure, Plant productivity and health, Inadequate livestock shelter, Wind erosion.

Before Situation:

The health of trees and/or shrubs in a windbreak/shelterbelt has degraded as plants age, or plants may have been damaged by weather events or pests, decreasing the effectiveness of the original windbreak design. Plants lack leaf cover, have dead branches, gaps with no live green material, or may be completely dead. Wind moves freely through areas that lack foliage.

After Situation:

The integrity of 726 linear feet (one acre) of windbreak/ shelterbelt has been restored and is functioning properly to reduce wind impacts to plants, animals, humans, and structures.

Feature Measure: Length of Renovation

Scenario Unit: Feet

Scenario Typical Size: 726.0

Scenario Total Cost: $3,608.09

Scenario Cost/Unit: $4.97

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$96.65	8	$773.20
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	4	$89.16
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$11.47	18	$206.46
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	26	$628.94
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	8	$269.12
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	4	$444.84
Materials						
Shrub, Seedling, Large	1508	Bare root shrub seedling, 36 to 60 inches tall; includes tropical containerized seedlings larger than 20 cubic inches. Includes materials and shipping only.	Each	$2.82	36	$101.52
Tree, Hardwood, Seedling, Medium	1510	Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only.	Each	$1.52	36	$54.72
Tree, Conifer, Seedling, Large	1515	Containerized conifer seedlings, 15 or 20 cubic inches; or bare root conifer seedlings 2+1 (three-year old seedlings that grew two years in the original seedbed and another year in a transplant bed) or bare root seedlings 3+0 and older (three-year or older seedlings grown in their original seedbed, or transplanted seedlings). Includes materials and shipping only.	Each	$1.33	36	$47.88
Tree, Hardwood, Potted, Small	1529	Potted hardwood seedling, 1 quart to 1 gallon. Includes materials and shipping only.	Each	$7.78	36	$280.08
Tree, Conifer, Potted, Small	1534	Potted conifer seedling, 1 quart to 1 gallon. Includes materials and shipping only.	Each	$5.71	36	$205.56

Tree shelter, mesh tree tube, 24 in.	1555	24 inch tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only.	Each	$0.40	90	$36.00
Tree shelter, solid tube type, 3-1/4 in. x 30 in.	1560	3-1/4 inch x 30 inch tree tube for protection from animal damage. Materials only.	Each	$1.72	90	$154.80
Stakes, wood, 3/4 in. x 3/4 in. x 36 in.	1581	3/4 in. x 3/4 in. x 36 in. wood stakes to fasten items in place. Includes materials only.	Each	$0.77	90	$69.30
Stake, bamboo, 3/8 in. x 36 in.	1584	3/8 in. x 36 in. bamboo stakes to anchor items in place. Inlcudes materials and shipping only.	Each	$0.12	90	$10.80
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 656 - Constructed Wetland

Scenario: #1 - Small, Less Than 0.1 ac

Scenario Description:

This practice scenario includes the basic earthwork and native and/or organic wetland vegetation needed to create a constructed wetland to treat contaminated agricultural runoff for a small site (i.e. <0.1 ac). All other components, such as water control structures, dikes or upstream sediment basins, must be paid for under facilitating practices. Soil, water and tissue sampling are required. The purpose of the practice is to address resource concerns related to water quality degradation due to excess nutrient and pathogens. Associated practices: Structure for Water Control (587); Sediment Basin (350); Dike (356); Pond Sealing or Lining, Compacted Clay Treatment (521D); Pond Sealing or Lining, Flexible Membrane (521A); Fence (382); Grade Stabilization Structure (410); Pumping Plant (533); Waste Transfer (634)

Before Situation:

Contaminated agricultural runoff causes excess ponding and/or water quality degradation.

After Situation:

A 2000 sq foot constructed wetland (i.e. 20' x 100') will be constructed with an average 18" depth. Only the earthwork and wetland vegetation are considered in this scenario. Any structures or sediment basins will be designed under a separate practice. The constructed wetland treats the effluent by reducing excess nutrients and adding oxygen through wetland plants and functions before the effluent is transported to a waste storage facility or discharged off site, if permitted by regulation.

Feature Measure: Area of Constructed Wetland

Scenario Unit: Square Feet

Scenario Typical Size: 2,000.0

Scenario Total Cost: $1,286.68

Scenario Cost/Unit: $0.64

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Clearing and Grubbing	40	Clearing and Grubbing, includes materials, equipment and labor	Acres	$325.13	0.05	$16.26
Stripping and stockpiling, topsoil	1199	Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor.	Cubic Yards	$0.87	37	$32.19
Excavation, common earth, small equipment, 50 ft	1220	Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yards	$2.13	74	$157.62
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	4	$96.76
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$11.76	2	$23.52
Test, Plant Tissue Test	301	Tissue analysis for crops. Includes materials and shipping only.	Each	$22.74	1	$22.74
Test, Standard Water Test, Well Water	309	Well Water Suitability test. Includes materials and shipping only.	Each	$47.11	8	$376.88
Native Aquatic Plants, Emergent or Submerged	2336	Native aquatic emergent or submerged. All required materials for establishing vegetation. Includes material and shipping.	Each	$1.00	325	$325.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 656 - Constructed Wetland

Scenario: #2 - Medium, 0.1 to 0.5 ac

Scenario Description:

This practice scenario includes the basic earthwork and native and/or organic wetland vegetation needed to create a constructed wetland to treat contaminated agricultural runoff for a medium site (i.e. 0.1 - 0.5 ac). All other components, such as water control structures, dikes or upstream sediment basins, must be paid for under facilitating practices. Soil, water and tissue sampling are required. The purpose of the practice is to address resource concerns related to water quality degradation due to excess nutrient and pathogens. Associated practices: Structure for Water Control (587); Sediment Basin (350); Dike (356); Pond Sealing or Lining, Compacted Clay Treatment (521D); Pond Sealing or Lining, Flexible Membrane (521A); Fence (382); Grade Stabilization Structure (410); Pumping Plant (533); Waste Transfer (634)

Before Situation:

Contaminated agricultural runoff causes excess ponding and/or water quality degradation.

After Situation:

A 0.25 acre constructed wetland (i.e. 45' x 240') will be constructed with an average 18" depth. Only the earthwork and wetland vegetation are considered in this scenario. Any structures or sediment basins will be designed under a separate practice. The constructed wetland is sited near the property boundary, but still takes cropland out of production (1/2 wetland acreage). The constructed wetland treats the effluent by reducing excess nutrients and adding oxygen through wetland plants and functions before the effluent is transported to a waste storage facility or discharged off site, if permitted by regulation.

Feature Measure: Area of Constructed Wetland

Scenario Unit: Acres

Scenario Typical Size: 0.3

Scenario Total Cost: $3,458.45

Scenario Cost/Unit: $13,833.81

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Clearing and Grubbing	40	Clearing and Grubbing, includes materials, equipment and labor	Acres	$325.13	0.25	$81.28
Stripping and stockpiling, topsoil	1199	Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor.	Cubic Yards	$0.87	200	$174.00
Excavation, common earth, small equipment, 50 ft	1220	Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yards	$2.13	400	$852.00
Foregone Income						
FI, Hay, General Grass	2122	General Grass Hay is Primary Land Use	Ton	$30.49	0.12	$3.66
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	14	$338.66
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$11.76	2	$23.52
Test, Plant Tissue Test	301	Tissue analysis for crops. Includes materials and shipping only.	Each	$22.74	1	$22.74
Test, Standard Water Test, Well Water	309	Well Water Suitability test. Includes materials and shipping only.	Each	$47.11	8	$376.88
Native Aquatic Plants, Emergent or Submerged	2336	Native aquatic emergent or submerged. All required materials for establishing vegetation. Includes material and shipping.	Each	$1.00	1350	$1,350.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 656 - Constructed Wetland

Scenario: #3 - Large, More Than 0.5 ac

Scenario Description:

This practice scenario includes the basic earthwork and native and/or organic wetland vegetation needed to create a constructed wetland to treat contaminated agricultural runoff for a large site (i.e. >0.5 ac). All other components, such as water control structures, dikes or upstream sediment basins, must be paid for under facilitating practices. Soil, water and tissue sampling are required. The purpose of the practice is to address resource concerns related to water quality degradation due to excess nutrient and pathogens. Associated practices: Structure for Water Control (587); Sediment Basin (350); Dike (356); Pond Sealing or Lining, Compacted Clay Treatment (521D); Pond Sealing or Lining, Flexible Membrane (521A); Fence (382); Grade Stabilization Structure (410); Pumping Plant (533); Waste Transfer (634)

Before Situation:

Contaminated agricultural runoff causes excess ponding and/or water quality degradation.

After Situation:

A 1 acre constructed wetland (i.e. 95' x 460') will be constructed with an average 18" depth. Only the earthwork and wetland vegetation are considered in this scenario. Any structures or sediment basins will be designed under a separate practice. The constructed wetland is sited near the property boundary, but still takes cropland out of production (1/2 wetland acreage). The constructed wetland treats the effluent by reducing excess nutrients and adding oxygen through wetland plants and functions before the effluent is transported to a waste storage facility or discharged off site, if permitted by regulation.

Feature Measure: Area of Constructed Wetland

Scenario Unit: Acres

Scenario Typical Size: 1.0

Scenario Total Cost: $9,651.56

Scenario Cost/Unit: $9,651.56

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Clearing and Grubbing	40	Clearing and Grubbing, includes materials, equipment and labor	Acres	$325.13	1	$325.13
Stripping and stockpiling, topsoil	1199	Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor.	Cubic Yards	$0.87	809	$703.83
Excavation, common earth, small equipment, 50 ft	1220	Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yards	$2.13	1619	$3,448.47
Foregone Income						
FI, Hay, General Grass	2122	General Grass Hay is Primary Land Use	Ton	$30.49	0.5	$15.25
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	37	$895.03
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$11.76	2	$23.52
Test, Plant Tissue Test	301	Tissue analysis for crops. Includes materials and shipping only.	Each	$22.74	1	$22.74
Test, Standard Water Test, Well Water	309	Well Water Suitability test. Includes materials and shipping only.	Each	$47.11	8	$376.88
Native Aquatic Plants, Emergent or Submerged	2336	Native aquatic emergent or submerged. All required materials for establishing vegetation. Includes material and shipping.	Each	$1.00	3605	$3,605.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 657 - Wetland Restoration

Scenario: #1 - Mineral Flat

Scenario Description:

A Mineral Flat wetland is to be restored. The tract size is 160 Acres consists of surface saturated soils interspersed with shallow depressions that are not depressional class HGM wetlands. The wetland size is also 160 acres. Resource Concerns are: 4-SOIL QUALITY DEGRADATION - Organic matter depletion, 11- WATER QUALITY DEGRADATION - Excess nutrients in surface and ground waters, 12 - WATER QUALITY DEGRADATION - Pesticides transported to surface and ground waters, 16 - WATER QUALITY DEGRADATION - Excessive sediment in surface waters, 18 - DEGRADED PLANT CONDITION - Undesirable plant productivity and health, 19 - DEGRADED PLANT CONDITION, Inadequate strucuture and composition, 22- INADEQUATE HABITAT FOR FISH AND WILDLIFE - Habitat degradation.

Before Situation:

The site has been drained with a tile drain system. A suitable seed bank exists for natural regeneration to re-establish hydrophytic vegetation. The site is in agricultural production.

After Situation:

The drain tiles have been rendered non-functional by excavating 50 foot lengths of tile mains and laterals in 24 separate locations, and backfilling with excavated earth, which is compacted with the excavator bucket. There are no facilitating practices. Restoration of hydrology and plant community functions will improve the WATER QUALITY and DEGRADED PLANT CONDITION concerns listed above. The hydrologic and vegetative practices will address the SOIL QUALITY DEGRADATION and INADEQUATE HABITAT FOR FISH AND WILDLIFE concerns.

Feature Measure: Acres of Tract

Scenario Unit: Acres

Scenario Typical Size: 160.0

Scenario Total Cost: $2,246.43

Scenario Cost/Unit: $14.04

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Hydraulic Excavator, .5 CY	930	Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included.	Hours	$57.32	24	$1,375.68
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	24	$635.04
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 657 - Wetland Restoration

Scenario: #3 - Riverine Levee Removal and Floodplain Features

Scenario Description:

A Riverine HGM tract on a large floodplain is to be restored. It has been converted to agricultural production by surface ditching and clearing of woody vegetation. The size of the tract is 100 acres. The wetland extent is 60 acres, and 40 acres are adjacent non-wetland. Resource Concerns are: 4-SOIL QUALITY DEGRADATION - Organic matter depletion, 11- WATER QUALITY DEGRADATION - Excess nutrients in surface and ground waters, 12 - WATER QUALITY DEGRADATION - Pesticides transported to surface and ground waters, 16 - WATER QUALITY DEGRADATION - Excessive sediment in surface waters, 18 - DEGRADED PLANT CONDITION - Undesirable plant productivity and health, 19 - DEGRADED PLANT CONDITION, Inadequate strucuture and composition, 22- INADEQUATE HABITAT FOR FISH AND WILDLIFE - Habitat degradation.

Before Situation:

A levee prevents floodwater from entering the tract. The original cover was forest. The site is drained by surface ditches which collect surface water and direct it to the river through a flap gate structure. The site has been completely cleared, and no suitable adjacent seedwall exists for natural regeneration of forest species. The lateral connectivity between the channel and floodplain has been altered by construction of levees along the reach.

After Situation:

The hydrology of the site is restored with the installation of ditch plugs, and the excavation of macrotopographic features with an average depth of 6" over 30% of the wetland area. Excavated spoil is placed adjacent to the features on the wetland and adjacent non-wetland area with a maximum depth of 24 inches. The levee has been breached at the upstream and downstream ends of the tract reach, restoring dynamic stream flooding. The breach length is 150 feet long at both locations. Both the wetland and non-wetland areas are planted with a Bottomland Hardwood species mix. The levee breaches are armored with rock riprap. Facilitating practices include Grade Stabilization Structure and Tree and Shrub Planting. Restoration of hydrology and plant community functions will improve the WATER QUALITY and DEGRADED PLANT CONDITION concerns listed above. The hydrologic and vegetative practices will address the SOIL QUALITY DEGRADATION and INADEQUATE HABITAT FOR FISH AND WILDLIFE concerns.

Feature Measure: Acres of Tract

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $35,711.69

Scenario Cost/Unit: $357.12

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	16520	$34,361.60
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	3	$1,350.09

Practice: 657 - Wetland Restoration

Scenario: #4 - Depression Sediment Removal and Ditch Plug

Scenario Description:

A Depressional HGM class wetland is to be restored. The tract size is 15 acres, and the actual wetland size is 10 acres. The site is a recharge depression, fed only from surface runoff. Resource Concerns are: 4-SOIL QUALITY DEGRADATION - Organic matter depletion, 11- WATER QUALITY DEGRADATION - Excess nutrients in surface and ground waters, 12 - WATER QUALITY DEGRADATION - Pesticides transported to surface and ground waters, 16 - WATER QUALITY DEGRADATION - Excessive sediment in surface waters, 18 - DEGRADED PLANT CONDITION - Undesirable plant productivity and health, 19 - DEGRADED PLANT CONDITION, Inadequate strucuture and composition, 22- INADEQUATE HABITAT FOR FISH AND WILDLIFE - Habitat degradation.

Before Situation:

The wetland has been converted to agricultural production, and the tract drained with a surface ditch. The ditch is 4' average depth, and 12 feet average width. The wetland receives surface runoff from an adjacent upland watershed, and ponds water on a shallow perched layer. The watershed has been converted from native to agricultural landuse, and the resultant soil erosion has deposited 6" of sediment in the bottom of the depression.

After Situation:

The ditch has been plugged by the installation of a 50' long section of compacted clay fill, and the deposition has been removed down to the original topsoil layer. A herbaceous plant community has been seeded. Facilitative practices include Conservation Cover. Restoration of hydrology and plant community functions will improve the WATER QUALITY and DEGRADED PLANT CONDITION concerns listed above. The hydrologic and vegetative practices will address the SOIL QUALITY DEGRADATION and INADEQUATE HABITAT FOR FISH AND WILDLIFE concerns.

Feature Measure: Acres of Tract

Scenario Unit: Acres

Scenario Typical Size: 15.0

Scenario Total Cost: $18,052.33

Scenario Cost/Unit: $1,203.49

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	8067	$16,779.36
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	89	$372.91
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	2	$900.06

Practice: 657 - Wetland Restoration

Scenario: #6 - Riverine Channel and Floodplain Restoration

Scenario Description:

A Riverine HGM landscape on a small stream on a low stream order riparian landscape has been converted to agricultural production. The stream channel has degraded. The reach is 1500 feet in length, and the tract size is 15 acres. The wetland area is 10 acres. Resource Concerns are: 4-SOIL QUALITY DEGRADATION - Organic matter depletion, 11- WATER QUALITY DEGRADATION - Excess nutrients in surface and ground waters, 12 - WATER QUALITY DEGRADATION - Pesticides transported to surface and ground waters, 16 - WATER QUALITY DEGRADATION - Excessive sediment in surface waters, 18 - DEGRADED PLANT CONDITION - Undesirable plant productivity and health, 19 - DEGRADED PLANT CONDITION, Inadequate strucuture and composition, 22- INADEQUATE HABITAT FOR FISH AND WILDLIFE - Habitat degradation.

Before Situation:

Channel incision has broken the lateral connectivity between the stream and floodplain. The coversion to cropland was accompanied by filling and leveling of backswamp, side channel, and oxbow features which formerly ponded water or exposed the floodplain groundwater table. The site no longer has access to floodwater or water surface profile supported groundwater. No suitable seed bank exists for natural regeneration of the original hydrophytic plant community, either in the channel, or on the floodplain.

After Situation:

The hydrology of the site is restored by the installation of a series of rock check structures to raise the stream water surface profile. Floodplain macrotopographic features replicating the original side channels, oxbows, and backswamps are constructed by excavation. Spoil is placed adjacent to the excavations to replicate natural depositional features. The average depth of the excavated features is 2 feet, and the surface area of the excavations is 25% of the tract size. The eroding stream bank is stabilized with soil bio-engineering features, and fish habitat improvement measures are installed in the channel. The tract is seeded to appropriate hydrophytic and upland vegetation, both woody and herbaceous. Facilitating practices are Streambank and Shoreline protection, Structure for Water Control, Conservation Cover, Tree/Shrub Establishment, and Stream Habitat Improvement and Management. Restoration of hydrology and plant community functions will improve the WATER QUALITY and DEGRADED PLANT CONDITION concerns listed above. The hydrologic and vegetative practices will address the SOIL QUALITY DEGRADATION and INADEQUATE HABITAT FOR FISH AND WILDLIFE concerns.

Feature Measure: Acres of Tract

Scenario Unit: Acres

Scenario Typical Size: 15.0

Scenario Total Cost: $7,192.06

Scenario Cost/Unit: $479.47

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	3025	$6,292.00
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	2	$900.06

Practice: 658 - Wetland Creation

Scenario: #1 - Wetland Creation, Wildlife Pond

Scenario Description:

A wetland is created on a flat mineral upland at a location where surface runoff may be intercepted and ponded by excavation. Resource concerns are 22 - INDEQUATE HABITAT FOR FISH AND WILDLIFE - Habitat degradation.

Before Situation:

The site is in cropland on an upland, non floodplain site (interfluve).

After Situation:

An excavation with an average depth of 12" has created a shallow depression in a broad swale which intercepts surface runoff. The excavated material has been spread on adjacent areas. The INADEQUATE HABITAT FOR FISH AND WILDLIFE resource concern has been addressed with the provision of seasonal open water for terrestrial, aquatic, and waterfowl species.

Feature Measure: Acres of Wetland

Scenario Unit: Acres

Scenario Typical Size: 5.0

Scenario Total Cost: $17,679.42

Scenario Cost/Unit: $3,535.88

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	8067	$16,779.36
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	2	$900.06

Practice: 659 - Wetland Enhancement

Scenario: #1 - Mineral Flat

Scenario Description:

A Mineral Flat wetland is to be enhanced. The tract size is 160 Acres consists of surface saturated soils interspersed with shallow depressions that are not depressional class HGM wetlands. The wetland size is also 160 acres. Resource Concerns are: 4-SOIL QUALITY DEGRADATION - Organic matter depletion, 11- WATER QUALITY DEGRADATION - Excess nutrients in surface and ground waters, 12 - WATER QUALITY DEGRADATION - Pesticides transported to surface and ground waters, 16 - WATER QUALITY DEGRADATION - Excessive sediment in surface waters, 18 - DEGRADED PLANT CONDITION - Undesirable plant productivity and health, 19 - DEGRADED PLANT CONDITION, Inadequate strucuture and composition, 22- INADEQUATE HABITAT FOR FISH AND WILDLIFE - Habitat degradation.

Before Situation:

The site has been drained with a tile drain system. A suitable seed bank exists for natural regeneration to re-establish hydrophytic vegetation. The site is in agricultural production.

After Situation:

The drain tiles have been rendered non-functional by excavating 50 foot lengths of tile mains and laterals in 24 separate locations, and backfilling with excavated earth, which is compacted with the excavator bucket. There are no facilitating practices. Enhancement of hydrology and plant community functions will improve the WATER QUALITY and DEGRADED PLANT CONDITION concerns listed above. The hydrologic and vegetative practices will address the SOIL QUALITY DEGRADATION and INADEQUATE HABITAT FOR FISH AND WILDLIFE concerns.

Feature Measure: Acres of Tract

Scenario Unit: Acres

Scenario Typical Size: 160.0

Scenario Total Cost: $2,246.43

Scenario Cost/Unit: $14.04

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Hydraulic Excavator, .5 CY	930	Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included.	Hours	$57.32	24	$1,375.68
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	24	$635.04
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 659 - Wetland Enhancement

Scenario: #3 - Riverine Levee Removal and Floodplain Features

Scenario Description:

A Riverine HGM tract on a large floodplain is to be enhanced. It has been converted to agricultural production by surface ditching and clearing of woody vegetation. The size of the tract is 100 acres. The wetland extent is 60 acres, and 40 acres are adjacent non-wetland. Resource Concerns are: 4-SOIL QUALITY DEGRADATION - Organic matter depletion, 11- WATER QUALITY DEGRADATION - Excess nutrients in surface and ground waters, 12 - WATER QUALITY DEGRADATION - Pesticides transported to surface and ground waters, 16 - WATER QUALITY DEGRADATION - Excessive sediment in surface waters, 18 - DEGRADED PLANT CONDITION - Undesirable plant productivity and health, 19 - DEGRADED PLANT CONDITION, Inadequate strucuture and composition, 22- INADEQUATE HABITAT FOR FISH AND WILDLIFE - Habitat degradation.

Before Situation:

A levee prevents floodwater from entering the tract. The original cover was forest. The site is drained by surface ditches which collect surface water and direct it to the river through a flap gate structure. The site has been completely cleared, and no suitable adjacent seedwall exists for natural regeneration of forest species. The lateral connectivity between the channel and floodplain has been altered by construction of levees along the reach.

After Situation:

The hydrology of the site is enhanced with the installation of ditch plugs, and the excavation of macrotopographic features with an average depth of 6" over 30% of the wetland area. Excavated spoil is placed adjacent to the features on the wetland and adjacent non-wetland area with a maximum depth of 24 inches. The levee has been breached at the upstream and downstream ends of the tract reach, restoring dynamic stream flooding. The breach length is 150 feet long at both locations. Both the wetland and non-wetland areas are planted with a Bottomland Hardwood species mix. The levee breaches are armored with rock riprap. Facilitating practices include Grade Stabilization Structure and Tree and Shrub Planting. Restoration of hydrology and plant community functions will improve the WATER QUALITY and DEGRADED PLANT CONDITION concerns listed above. The hydrologic and vegetative practices will address the SOIL QUALITY DEGRADATION and INADEQUATE HABITAT FOR FISH AND WILDLIFE concerns.

Feature Measure: Acres of Tract

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $41,390.09

Scenario Cost/Unit: $413.90

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	19250	$40,040.00
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	3	$1,350.09

Practice: 659 - Wetland Enhancement

Scenario: #4 - Depression Sediment Removal and Ditch Plug

Scenario Description:

A Depressional HGM class wetland is to be enhanced. The tract size is 15 acres, and the actual wetland size is 10 acres. The site is a recharge depression, fed only from surface runoff. Resource Concerns are: 4-SOIL QUALITY DEGRADATION - Organic matter depletion, 11- WATER QUALITY DEGRADATION - Excess nutrients in surface and ground waters, 12 - WATER QUALITY DEGRADATION - Pesticides transported to surface and ground waters, 16 - WATER QUALITY DEGRADATION - Excessive sediment in surface waters, 18 - DEGRADED PLANT CONDITION - Undesirable plant productivity and health, 19 - DEGRADED PLANT CONDITION, Inadequate strucuture and composition, 22- INADEQUATE HABITAT FOR FISH AND WILDLIFE - Habitat degradation.

Before Situation:

The wetland has been converted to agricultural production, and the tract drained with a surface ditch. The ditch is 4' average depth, and 12 feet average width. The wetland receives surface runoff from an adjacent upland watershed, and ponds water on a shallow perched layer. The watershed has been converted from native to agricultural landuse, and the resultant soil erosion has deposited 6" of sediment in the bottom of the depression.

After Situation:

The ditch has been plugged by the installation of a 50' long section of compacted clay fill, and the deposition has been removed down to the original topsoil layer. A herbaceous plant community has been seeded. Facilitative practices include Conservation Cover. Restoration of hydrology and plant community functions will improve the WATER QUALITY and DEGRADED PLANT CONDITION concerns listed above. The hydrologic and vegetative practices will address the SOIL QUALITY DEGRADATION and INADEQUATE HABITAT FOR FISH AND WILDLIFE concerns.

Feature Measure: Acres of Tract

Scenario Unit: Acres

Scenario Typical Size: 15.0

Scenario Total Cost: $18,052.33

Scenario Cost/Unit: $1,203.49

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	8067	$16,779.36
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.19	89	$372.91
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	2	$900.06

Practice: 659 - Wetland Enhancement

Scenario: #6 - Riverine Channel and Floodplain Restoration

Scenario Description:

A Riverine HGM landscape on a small stream on a low stream order riparian landscape has been converted to agricultural production. The stream channel has degraded. The reach is 1500 feet in length, and the tract size is 15 acres. The wetland area is 10 acres. Resource Concerns are: 4-SOIL QUALITY DEGRADATION - Organic matter depletion, 11- WATER QUALITY DEGRADATION - Excess nutrients in surface and ground waters, 12 - WATER QUALITY DEGRADATION - Pesticides transported to surface and ground waters, 16 - WATER QUALITY DEGRADATION - Excessive sediment in surface waters, 18 - DEGRADED PLANT CONDITION - Undesirable plant productivity and health, 19 - DEGRADED PLANT CONDITION, Inadequate strucuture and composition, 22- INADEQUATE HABITAT FOR FISH AND WILDLIFE - Habitat degradation.

Before Situation:

Channel incision has broken the lateral connectivity between the stream and floodplain. The coversion to cropland was accompanied by filling and leveling of backswamp, side channel, and oxbow features which formerly ponded water or exposed the floodplain groundwater table. The site no longer has access to floodwater or water surface profile supported groundwater. No suitable seed bank exists for natural regeneration of the original hydrophytic plant community, either in the channel, or on the floodplain.

After Situation:

The hydrology of the site is restored by the installation of a series of rock check structures to raise the stream water surface profile. Floodplain macrotopographic features replicating the original side channels, oxbows, and backswamps are constructed by excavation. Spoil is placed adjacent to the excavations to replicate natural depositional features. The average depth of the excavated features is 2 feet, and the surface area of the excavations is 25% of the tract size. The eroding stream bank is stabilized with soil bio-engineering features, and fish habitat improvement measures are installed in the channel. The tract is seeded to appropriate hydrophytic and upland vegetation, both woody and herbaceous. Facilitating practices are Streambank and Shoreline protection, Structure for Water Control, Conservation Cover, Tree/Shrub Establishment, and Stream Habitat Improvement and Management. Restoration of hydrology and plant community functions will improve the WATER QUALITY and DEGRADED PLANT CONDITION concerns listed above. The hydrologic and vegetative practices will address the SOIL QUALITY DEGRADATION and INADEQUATE HABITAT FOR FISH AND WILDLIFE concerns.

Feature Measure: Acres of Tract

Scenario Unit: Acres

Scenario Typical Size: 15.0

Scenario Total Cost: $7,192.06

Scenario Cost/Unit: $479.47

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.08	3025	$6,292.00
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	2	$900.06

Practice: 660 - Tree/Shrub Pruning

Scenario: #1 - Pruning

Scenario Description:

Pruning trees of branches in a forest stand where wildfires are considered a high and very high hazard. Hand tools and power tools are used to cut branches from trees. Resource concerns include Degraded plant condition-wildfire hazard and Undesirable plant productivity and health.

Before Situation:

The forest stand is well to over-stocked, generally with 200 to 300+ trees per acre. Branches are touching understory vegetation or are in close proximity to forest floor where a ground fire can ignite the lower branches and move into the upper canopy. Wildfire hazard is very high.

After Situation:

The typical forest pruning treatment is 20 acres. Trees are pruned to the desirable height (generally 8-10') based on desired separation space between ground vegetation and tree crown. Pruned branches are treated if they are a hazard, see Woody Residue Treatment standard.

Feature Measure: area of treatment

Scenario Unit: Acres

Scenario Typical Size: 20.0

Scenario Total Cost: $4,402.68

Scenario Cost/Unit: $220.13

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.59	60	$395.40
Pruning tools, hand tools	1318	Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included.	Hours	$2.13	20	$42.60
Pruning tool, pole saw	1319	Gasoline powered pole chainsaw. Labor not included.	Hours	$8.63	60	$517.80
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	120	$2,902.80
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	12	$544.08

Practice: 660 - Tree/Shrub Pruning

Scenario: #2 - Pruning-Low Height

Scenario Description:

Pruning is done by hand with chain saws, tree loppers, hand shears, or hand saws. Trees are identified for pruning. To improve the quality of the stem wood, branches are pruned from the trees. Trees are growing at a fast pace, with leader growth on trees anywhere from 1.5 feet to 4 feet in length.

Before Situation:

Trees are retaining lower limbs along the entire tree bole, reducing wood quality. Pruning height will be based on overall stand diameter and height. Stand has been thinned and crop trees are identified for pruning. Degrade plant condition- undesirable plant productivity and health is the resource concern.

After Situation:

The typical forest pruning treatment is 20 acres. Trees are pruned to the desirable height of 8-10 feet. Pruned branches are treated if they are a hazard, see Woody Residue Treatment standard.

Feature Measure: area of treatment

Scenario Unit: Acres

Scenario Typical Size: 20.0

Scenario Total Cost: $3,185.10

Scenario Cost/Unit: $159.26

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.59	80	$527.20
Pruning tools, hand tools	1318	Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included.	Hours	$2.13	20	$42.60
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	80	$1,935.20
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	15	$680.10

Practice: 660 - Tree/Shrub Pruning

Scenario: #3 - Pruning- High Height

Scenario Description:

Pruning is done by hand with pole saws or with gas pole saw. Crop trees are identified for pruning. The forest is on highly productive soils. Trees are growing at a fast pace, with leader growth on trees anywhere from 1.5 feet to 4 feet in length. To improve the quality of the stem wood, branches are pruned from the trees.

Before Situation:

Trees are retaining limbs mostly along the mid to upper section of the tree bole, reducing quality. Lower branches (0-8 feet) may have already been pruned, have naturally self pruned to differing heights. Pruning height is at least to eighteen (18) feet above the ground. Degrade plant condition- undesirable plant productivity and health is the resource concern.

After Situation:

The typical forest pruning treatment is 20 acres. Trees are pruned to the height of 18 feet or more. Pruned branches are treated so they do not become a fire or health hazard.

Feature Measure: area of treatment

Scenario Unit: Acres

Scenario Typical Size: 20.0

Scenario Total Cost: $7,919.50

Scenario Cost/Unit: $395.98

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.59	100	$659.00
Pruning tools, hand tools	1318	Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included.	Hours	$2.13	200	$426.00
Pruning tool, pole saw	1319	Gasoline powered pole chainsaw. Labor not included.	Hours	$8.63	100	$863.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	200	$4,838.00
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	25	$1,133.50

Practice: 660 - Tree/Shrub Pruning

Scenario: #4 - Pruning-Wildlife

Scenario Description:

Pruning of hard/soft mast trees and shrubs to stimulate increased fruit/nut production for wildlife food. Primarily done around old agricultural fields, in old orchards, in forested areas. Is usually done with a chainsaw or handsaw to open the canopy and remove dead branches to increase airflow and sunlight penetration. Resource concerns are inadequate habitat for fish and wildlife - habitat degrdation and plant condition- undesirable plant productivity and health

Before Situation:

Trees have reduced mast production due to tree reaching maturity or heavy shade. Pruning is needed to remove older branches, dead material and increase sunlight into the canopy. New branching will be stimulated, increasing mast production.

After Situation:

Selected trees (10 per acre) are re-invigorated with new branching and an increase in mast production.

Feature Measure: area of treatment

Scenario Unit: Acres

Scenario Typical Size: 2.0

Scenario Total Cost: $429.98

Scenario Cost/Unit: $214.99

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.59	5	$32.95
Pruning tools, hand tools	1318	Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included.	Hours	$2.13	10	$21.30
Pruning tool, pole saw	1319	Gasoline powered pole chainsaw. Labor not included.	Hours	$8.63	5	$43.15
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	10	$241.90
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	2	$90.68

Practice: 660 - Tree/Shrub Pruning

Scenario: #5 - Pruning-Multistory Cropping Understory

Scenario Description:

Pruning trees and/or shrubs is accomplished to extend the life span of trees and or shrubs. Pruning reduces the time periods of replacement by 2/3rds, exposing less bare soil. Pruning is accomplished by hand with hand tools and/or chainsaw. Trees and or shrubs are growing where the average rainfall is very high, with cooler temperatures and deep steep soils. Resouce concerns are degraded plant condition-undesireable plant productivity and health, soil erosion-sheet and rill.

Before Situation:

Trees and/or shrubs are showing signs of reduced health (thinning crowns/less branching) and fruit production. Loss of trees or shrubs will occur within a few years. Severe soil erosion and sedimentation is a great concern if trees or shrubs are removed.

After Situation:

Tree/shrub pruning is completed on trees and/or shrubs. Cut vegetative material is left on the ground providing cover, and increasing organic matter. Alternative row pruning, treating every other row (or one-half the plants), in the same field, is completed 2 times. Renovation pruning is conducted one time for the entire field.

Feature Measure: individual tree/shrub pruned

Scenario Unit: Each

Scenario Typical Size: 800.0

Scenario Total Cost: $769.72

Scenario Cost/Unit: $0.96

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.59	10	$65.90
Pruning tools, hand tools	1318	Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included.	Hours	$2.13	4	$8.52
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	10	$241.90
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	10	$453.40

Practice: 660 - Tree/Shrub Pruning

Scenario: #6 - Pruning-Multistory Cropping-Overstory

Scenario Description:

Overstory tree crowns are pruned to increase sunlight to understory shrubs and low growing trees that have been purposely established to grow on the same acre of ground. Resource concern is degraded plant condition - undesirable plant productivity and health.

Before Situation:

The overstory trees are expanding their crowns, providing to much shade on the understory plants. The shade is affecting the growth and production of the understory plants. Pruning of branches, leaves, frawns, etc. are needed to maintain the desired amount of sunlight reaching the understory.

After Situation:

Pruning of the overstory tree crowns is completed, allowing the proper amount of sunlight to reach the understory vegetation, maintaining their growth, health and vigor, and wildlife benefits.

Feature Measure: Overstory Trees Pruned

Scenario Unit: Each

Scenario Typical Size: 120.0

Scenario Total Cost: $970.12

Scenario Cost/Unit: $8.08

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.59	12	$79.08
Pruning tools, hand tools	1318	Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included.	Hours	$2.13	12	$25.56
Pruning tool, pole saw	1319	Gasoline powered pole chainsaw. Labor not included.	Hours	$8.63	12	$103.56
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	24	$580.56
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	4	$181.36

Practice: 666 - Forest Stand Improvement

Scenario: #1 - Intermediate Silvicultural Rx Using Mastication Equipment on all slopes

Scenario Description:

Adjusting the density, species composition, and spatial arrangement with intermediate silvicultural techniques to achieve the desired condition in a stand of trees. The operation is supervised by a certified forest planner and/or certified TSP forester. This action and is carried out using light to medium mastication equipment, that is suited to the site and job . Resource concerns include Undesirable plant productivity and health; Wildlife habitat degradation; Wildfire hazard; and Inadequate structure and composition.

Before Situation:

The density, species composition, and spatial arrangement of trees in a stand are close to achieving the silvicultural specifications, but still require management to achieve desired conditions. The stand in this scenario still exhibit an increased susceptibility to insects and disease, an unacceptable uncharacteristic wildfire risk and/or hazard, and degraded undstory plant and wildlife conditions.

After Situation:

After adjusting the density, species composition, and spatial arrangement to an acceptable level, stand, and overall quality is improved. As a intermdeiate silvicultural action, the work is not intensive in nature, but meant to quickly and readily improve conditions related to the identified resource concern. Mastication in these stands will not create conditions that artificailly inflate the risk of carrying a fire, or degrading understory plant productivity and wildlife habitat.

Feature Measure: Effective Acres

Scenario Unit: Acres

Scenario Typical Size: 20.0

Scenario Total Cost: $5,052.73

Scenario Cost/Unit: $252.64

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.72	50	$2,536.00
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	15	$334.35
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	50	$1,323.00
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	4	$181.36
Materials						
Tree Marking Paint	313	Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only.	Acres	$8.78	5	$43.90
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	4	$634.12

Practice: 666 - Forest Stand Improvement

Scenario: #2 - Intermediate Silvicultural Rx by Handwork and Light Mechanical Equipment on all slopes

Scenario Description:

Adjusting the density, species composition, and spatial arrangement with intermediate silvicultural techniques such as single tree, crop tree, and other light thinning operations to achieve the desired condition in a forested stand. The operation is supervised by a certified forest planner and/or certified TSP forester. This silvicultural prescription is carried out using handtools such as chainsaws, and light equipment like sheers and grapple on a skidsteer, all of which are suited to the site and job . Resource concerns include, Undesirable plant productivity and health; Wildlife habitat degradation; Wildfire hazard; and Inadequate structure and composition, and degraded wildlife habitat.

Before Situation:

The density, species composition, and spatial arrangement of trees in a stand are close to achieving the silvicultural specifications, but still require management to achieve desired conditions. The stand in this scenario still exhibit an increased susceptibility to insects and disease, an unacceptable uncharacteristic wildfire risk and/or hazard, and degraded undstory plant and wildlife conditions. Given handwork is done a small scales and usually inoperable sites for ground based logging systems

After Situation:

After adjusting the density, species composition, and spatial arrangement to an acceptable level, stand, and overall quality is improved. As a intermediate silvicultural action, the work is not intensive in nature, but meant to quickly and readily improve conditions related to the identified resource concern. and to achieve desired condition.

Feature Measure: Effective Acres

Scenario Unit: Acres

Scenario Typical Size: 20.0

Scenario Total Cost: $10,413.42

Scenario Cost/Unit: $520.67

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.72	70	$3,550.40
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.59	80	$527.20
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	32	$713.28
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	80	$2,729.60
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	70	$1,852.20
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	8	$362.72
Materials						
Tree Marking Paint	313	Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only.	Acres	$8.78	5	$43.90
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	4	$634.12

Practice: 666 - Forest Stand Improvement

Scenario: #3 - Intermediate Silvicultural Rx Using Ground Based Logging, Heavy Equipment all slopes

Scenario Description:

Minimally adjusting the density, species composition, and spatial arrangement with minor silvicultural intensity to achieve the desired condition in a stand of trees. The operation is supervised by a certified forest planner and/or certified TSP forester. This action and is carried out using light or heavy mastication equipment, that is suited to the site and job . Resource concerns include Undesirable plant productivity and health; Wildlife habitat degradation; Wildfire hazard; and Inadequate structure and composition. Ground based logging will be used for larger projects, i.e. 50 acres+, where economies of scale will be able to drive costs down from current per acre estimates, and encourage larger treatment areas and effective acres

Before Situation:

The density, species composition, and spatial arrangement of trees in a stand are close to achieving the silvicultural specifications, but still require management to achieve desired conditions. The stand in this scenario still exhibit an increased susceptibility to insects and disease, an unacceptable uncharacteristic wildfire risk and/or hazard, and degraded undstory plant and wildlife conditions..

After Situation:

After adjusting the density, species composition, and spatial arrangement to an acceptable level, stand, and overall quality is improved. As a intermdeiate silvicultural action, the work is not intensive in nature, but meant to quickly and readily improve conditions related to the identified resource concern. and to achieve desired condition.

Feature Measure: Effective Acres

Scenario Unit: Acres

Scenario Typical Size: 20.0

Scenario Total Cost: $11,427.18

Scenario Cost/Unit: $571.36

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	10	$222.90
Feller buncher	941	Equipment and power unit costs. Labor not included.	Hours	$74.63	30	$2,238.90
Log skidder	942	Equipment and power unit costs. Labor not included.	Hours	$114.63	40	$4,585.20
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	70	$2,354.80
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	4	$181.36
Materials						
Tree Marking Paint	313	Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only.	Acres	$8.78	5	$43.90
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	4	$1,800.12

Practice: 666 - Forest Stand Improvement

Scenario: #4 - Even-aged Silvicultural Rx Using Mastication Equipment on All Slopes

Scenario Description:

Utilizing heavy mastication equipment to achieve even-aged silvicultural practices such as shelterwood, seed tree, and clearcuts, with and without reserves are employed to appropriately address resource concerns including, Undesirable plant productivity and health; Wildlife habitat degradation; Wildfire hazard; and Inadequate structure and composition.

Before Situation:

Large acreages of uniform stand structure, or where undesirable forest structure (species, age, size) that is susceptible to disease and fire. To qualify for mastication with even-aged silvicultural desired conditions, the site cannot have high basal areas, and stems per acre, as this will result in heavy surface fuels and obstructions that negate a resource benefit to the identified resource concerns.

After Situation:

Create conditions that support regeneration of desired species and densities, with spatial patterns that provide benefits to reduced fire behavior, and early successional wildlife habitat, and understory plant communities. Mastication in these stands will not create conditions that artificailly inflate the risk of carrying a fire or change other fire behavior characteristics, or degrading understory plant productivity and wildlife habitat.

Feature Measure: Area Treated

Scenario Unit: Acres

Scenario Typical Size: 20.0

Scenario Total Cost: $7,002.60

Scenario Cost/Unit: $350.13

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	10	$222.90
Mechanical cutter, chopper	943	Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included.	Hours	$90.63	40	$3,625.20
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	40	$1,345.60
Materials						
Tree Marking Paint	313	Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only.	Acres	$8.78	1	$8.78
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	4	$1,800.12

Practice: 666 - Forest Stand Improvement

Scenario: #5 - Even-aged Silvicultural Rx, Hand and Light Mechanized Equipment, on Slopes Less than 25%

Scenario Description:

Utilizing hand tools and light mechanized equipment on easily operable ground, to achieve even-aged silvicultural practices such as shelterwood, seed tree, and clearcuts, with and without reserves are employed to address resource concerns including Undesirable plant productivity and health; Wildlife habitat degradation; Wildfire hazard; and Inadequate structure and composition. Will only be used in select situations where larger equipment cannot operate due to primarily access issues.

Before Situation:

Large acreages of uniform stand structure (species, age, size) that is susceptible to disease and fire.

After Situation:

Create conditions that support regeneration of desired species and densities, with spatial patterns that provide benefits to reduced fire behavior, and early successional wildlife habitat, and understory plant communities.

Feature Measure: Area Treated

Scenario Unit: Acres

Scenario Typical Size: 20.0

Scenario Total Cost: $34,984.68

Scenario Cost/Unit: $1,749.23

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.72	240	$12,172.80
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.59	300	$1,977.00
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	80	$1,783.20
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	300	$10,236.00
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	240	$6,350.40
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	40	$1,813.60
Materials						
Tree Marking Paint	313	Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only.	Acres	$8.78	2	$17.56
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	4	$634.12

Practice: 666 - Forest Stand Improvement

Scenario: #6 - Even-aged Hand and Light Mechanized Equipment on Slopes Greater than 25%

Scenario Description:

Utilizing hand tools and light mechanized equipment on steeper ground, to achieve even-aged silvicultural practices such as shelterwood, seed tree, and clearcuts, with and without reserves are employed to address resource concerns including Undesirable plant productivity and health; Wildlife habitat degradation; Wildfire hazard; and Inadequate structure and composition. Will only be used in select situations where larger equipment cannot operate due to primarily access issues.

Before Situation:

Large acreages of uniform stand structure (species, age, size) that is susceptible to disease and fire.

After Situation:

Create conditions that support regeneration of desired species and densities, with spatial patterns that provide benefits to reduced fire behavior, and early successional wildlife habitat, and understory plant communities.

Feature Measure: Area treated

Scenario Unit: Acres

Scenario Typical Size: 20.0

Scenario Total Cost: $43,550.68

Scenario Cost/Unit: $2,177.53

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.72	140	$7,100.80
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.59	700	$4,613.00
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	80	$1,783.20
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	700	$23,884.00
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	140	$3,704.40
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	40	$1,813.60
Materials						
Tree Marking Paint	313	Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only.	Acres	$8.78	2	$17.56
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	4	$634.12

Practice: 666 - Forest Stand Improvement

Scenario: #7 - Even-aged Silvicultural Rx, Using Ground Based Heavy Equipment, on Slopes Less Than 25%

Scenario Description:

Utilizing ground based mechanized logging equipment on easily operable ground, to achieve even-aged silvicultural practices such as shelterwood, seed tree, and clearcuts, with and without reserves are employed to address resource concerns including Undesirable plant productivity and health; Wildlife habitat degradation; Wildfire hazard; and Inadequate structure and composition.

Before Situation:

Large acreages of uniform stand structure (species, age, size) that is susceptible to disease and fire.

After Situation:

Create conditions that support regeneration of desired species and densities, with spatial patterns that provide benefits to reduced fire behavior, and early successional wildlife habitat, and understory plant communities.

Feature Measure: Area treated

Scenario Unit: Acres

Scenario Typical Size: 20.0

Scenario Total Cost: $36,617.05

Scenario Cost/Unit: $1,830.85

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	15	$334.35
Feller buncher	941	Equipment and power unit costs. Labor not included.	Hours	$74.63	90	$6,716.70
Log skidder	942	Equipment and power unit costs. Labor not included.	Hours	$114.63	150	$17,194.50
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	240	$8,073.60
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	15	$680.10
Materials						
Tree Marking Paint	313	Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only.	Acres	$8.78	2	$17.56
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	8	$3,600.24

Practice: 666 - Forest Stand Improvement

Scenario: #8 - Even-aged Outcomes Using Ground Based Logging on Slopes Greater Than 25%

Scenario Description:

Utilizing ground based mechanized logging equipment on steeper ground, to achieve even-aged silvicultural practices such as shelterwood, seed tree, and clearcuts, with and without reserves are employed to address resource concerns including Undesirable plant productivity and health; Wildlife habitat degradation; Wildfire hazard; and Inadequate structure and composition.

Before Situation:

Large acreages of uniform stand structure (species, age, size) that is susceptible to disease and fire.

After Situation:

Create conditions that support regeneration of desired species and densities, with spatial patterns that provide benefits to reduced fire behavior, and early successional wildlife habitat, and understory plant communities.

Feature Measure: Area Treated

Scenario Unit: Acres

Scenario Typical Size: 20.0

Scenario Total Cost: $44,313.25

Scenario Cost/Unit: $2,215.66

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	15	$334.35
Feller buncher	941	Equipment and power unit costs. Labor not included.	Hours	$74.63	120	$8,955.60
Log skidder	942	Equipment and power unit costs. Labor not included.	Hours	$114.63	180	$20,633.40
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	300	$10,092.00
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	15	$680.10
Materials						
Tree Marking Paint	313	Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only.	Acres	$8.78	2	$17.56
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	8	$3,600.24

Practice: 666 - Forest Stand Improvement

Scenario: #9 - Uneven-aged Silvicultural Rx Using Mastication Equipment on All Slopes

Scenario Description:

Mastication will be used to achieve uneven-aged stand structure on all operable ground, where resource concerns including Undesirable plant productivity and health; Wildlife habitat degradation; Wildfire hazard; and Inadequate structure and composition. Will only be used in select situations where site productivity does not warrant utilization, and will not negatively impact goals associated with understory plant productivity and wildfire hazard.

Before Situation:

The density, species composition, and spatial arrangement of trees in a stand are close to achieving the silvicultural specifications, but still require management to achieve desired conditions. The stand in this scenario still exhibit an increased susceptibility to insects and disease, an unacceptable uncharacteristic wildfire risk and/or hazard, and degraded undstory plant and wildlife conditions. Large acreages of uniform stand structure, or where undesirable forest structure (species, age, size) that is susceptible to disease and fire. To qualify for mastication with Uneven-aged silvicultural desired conditions, the site cannot have high basal areas, and stems per acre that would be redistirbuted to the understory, as this will result in heavy surface fuels and obstructions that negate a resource benefit to the identified resource concerns.

After Situation:

Create conditions that support regeneration of desired species and densities, with spatial patterns that provide benefits to reduced fire behavior, and early successional wildlife habitat, and understory plant communities. Mastication in these stands will not create conditions that artificailly inflate the risk of carrying a fire or change other fire behavior characteristics, or degrading understory plant productivity and wildlife habitat.

Feature Measure: Affected Acres

Scenario Unit: Acres

Scenario Typical Size: 20.0

Scenario Total Cost: $8,731.62

Scenario Cost/Unit: $436.58

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	12	$267.48
Mechanical cutter, chopper	943	Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included.	Hours	$90.63	50	$4,531.50
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	50	$1,682.00
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	8	$362.72
Materials						
Tree Marking Paint	313	Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only.	Acres	$8.78	10	$87.80
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	4	$1,800.12

Practice: 666 - Forest Stand Improvement

Scenario: #10 - Uneven-aged Silvicultural Rx Using Hand and Light Mechanized Equipment on Slopes Less than 25%

Scenario Description:

Utilizing light equipment and hand work on accessible ground, to achieve uneven-aged silvicultural practices such as group selection and group retention, free thinning, single tree harvesting, are employed to address resource concerns including Undesirable plant productivity and health; Wildlife habitat degradation; Wildfire hazard; and Inadequate structure and composition.

Before Situation:

The density, species composition, and spatial arrangement of trees in a stand are close to achieving the silvicultural specifications, but still require management to achieve desired conditions. The stand in this scenario still exhibit an increased susceptibility to insects and disease, an unacceptable uncharacteristic wildfire risk and/or hazard, and degraded understory plant and wildlife conditions. Large acreages of uniform stand structure, or where undesirable forest structure (species, age, size) that is susceptible to disease and fire.

After Situation:

Create conditions that support regeneration of desired species and densities, with spatial patterns that provide benefits to reduced fire behavior, and early successional wildlife habitat, and understory plant communities. Mastication in these stands will not create conditions that artificially inflate the risk of carrying a fire or change other fire behavior characteristics, or degrading understory plant productivity and wildlife habitat.

Feature Measure: Affected Acres

Scenario Unit: Acres

Scenario Typical Size: 20.0

Scenario Total Cost: $36,296.12

Scenario Cost/Unit: $1,814.81

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.72	160	$8,115.20
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.59	480	$3,163.20
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	80	$1,783.20
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	480	$16,377.60
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	160	$4,233.60
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	40	$1,813.60
Materials						
Tree Marking Paint	313	Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only.	Acres	$8.78	20	$175.60
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	4	$634.12

Practice: 666 - Forest Stand Improvement

Scenario: #11 - Uneven-aged Silvicultural Rx Using Hand and Light Mechanized Equipment on Slopes Greater than 25%

Scenario Description:

Utilizing light equipment and hand work on steeper ground, to achieve uneven-aged silvicultural practices such as group selection and group retention, free thinning, single tree harvesting, are employed to address resource concerns including Undesirable plant productivity and health; Wildlife habitat degradation; Wildfire hazard; and Inadequate structure and composition.

Before Situation:

The density, species composition, and spatial arrangement of trees in a stand are close to achieving the silvicultural specifications, but still require management to achieve desired conditions. The stand in this scenario still exhibit an increased susceptibility to insects and disease, an unacceptable uncharacteristic wildfire risk and/or hazard, and degraded understory plant and wildlife conditions..

After Situation:

Create conditions that support regeneration of desired species and densities, with spatial patterns that provide benefits to reduced fire behavior, and early successional wildlife habitat, and understory plant communities. Mastication in these stands will not create conditions that artificially inflate the risk of carrying a fire or change other fire behavior characteristics, or degrading understory plant productivity and wildlife habitat.

Feature Measure: Affected Acres

Scenario Unit: Acres

Scenario Typical Size: 20.0

Scenario Total Cost: $45,030.42

Scenario Cost/Unit: $2,251.52

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.72	160	$8,115.20
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.59	650	$4,283.50
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	80	$1,783.20
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	650	$22,178.00
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	160	$4,233.60
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	80	$3,627.20
Materials						
Tree Marking Paint	313	Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only.	Acres	$8.78	20	$175.60
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	4	$634.12

Practice: 666 - Forest Stand Improvement

Scenario: #12 - Uneven-aged Silvicultural Rx, Using Ground Based Heavy Equipment, on Slopes Less than 25%

Scenario Description:

Utilizing ground based mechanical logging equipment on accessible ground, to achieve uneven-aged silvicultural practices such as group selection and group retention, free thinning, single tree harvesting, are employed to address resource concerns including Undesirable plant productivity and health; Wildlife habitat degradation; Wildfire hazard; and Inadequate structure and composition.

Before Situation:

The density, species composition, and spatial arrangement of trees in a stand are close to achieving the silvicultural specifications, but still require management to achieve desired conditions. The stand in this scenario still exhibit an increased susceptibility to insects and disease, an unacceptable uncharacteristic wildfire risk and/or hazard, and degraded understory plant and wildlife conditions..

After Situation:

Create conditions that support regeneration of desired species and densities, with spatial patterns that provide benefits to reduced fire behavior, and early successional wildlife habitat, and understory plant communities. Mastication in these stands will not create conditions that artificially inflate the risk of carrying a fire or change other fire behavior characteristics, or degrading understory plant productivity and wildlife habitat.

Feature Measure: Affected Acres

Scenario Unit: Acres

Scenario Typical Size: 20.0

Scenario Total Cost: $56,118.20

Scenario Cost/Unit: $2,805.91

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.59	60	$395.40
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	40	$891.60
Feller buncher	941	Equipment and power unit costs. Labor not included.	Hours	$74.63	140	$10,448.20
Log skidder	942	Equipment and power unit costs. Labor not included.	Hours	$114.63	210	$24,072.30
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	60	$2,047.20
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	350	$11,774.00
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	40	$1,813.60
Materials						
Tree Marking Paint	313	Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only.	Acres	$8.78	20	$175.60
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	10	$4,500.30

Practice: 670 - Energy Efficient Lighting System

Scenario: #2 - Lighting - LED

Scenario Description:

To install dimmable LEDs to replace incandescent lamps on a one-for-one basis. Light fixtures do not have to be replaced. A typical poultry house has 48 fixtures. LED requirements: minimum 6 Watt, 3700 Kelvin, dimmable, grow-out bulb; industrial grade; suitably protected from dirt accumulation. In high humidity environments or areas subject to wash down, gasketted or weatherproof housings are required to prevent corrosion and premature failure.

Before Situation:

An inefficient lighting system such as one using incandescent lamps has been identified by an on-farm energy audit.

After Situation:

More efficient lighting is provided by Light-Emitting Diode (LED) lamps in order to reduce energy use as evidenced by the energy audit.Associated practices/activities: 122-AgEMP - HQ and 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Each lamp replaced

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $12.43

Scenario Cost/Unit: $12.43

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	0.17	$4.11
Materials						
Lighting, bulb, LED, dimmable, minimum 450 lumens	1167	Light Emitting Diode (LED), typically 3700 Kelvin, dimmable, grow-out bulb; industrial grade; suitably protected from dirt accumulation. Materials only.	Each	$8.32	1	$8.32

Practice: 670 - Energy Efficient Lighting System

Scenario: #3 - Lighting - Linear LED

Scenario Description:

The lighting system consists of a LED linear fixture with light. Associated materials for installation of replacement fixtures are included. Appropriate disposal of existing lamps, ballasts and other materials is required.

Before Situation:

Inefficient lighting (such as incandescent or T12 fluorescent tubes driven by magnetic ballasts) as evidenced by an on-farm energy audit.

After Situation:

High-efficiency lighting system which reduces energy use. The new lighting equipment will provide suitable light levels and reduce overall power requirements (kW) compared to the existing lighting system as evidenced by the energy audit. Associated practices/activities: may include 122-AgEMP - HQ and 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Each fixture replaced

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $156.43

Scenario Cost/Unit: $156.43

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	1	$34.12
Materials						
Lighting, Exterior Fixture with LED, Min. 5,000 Lumens, IP65 Rated	2704	LED Lighting fixture with a minimum of 5,000 lumens for exterior/outdoor uses such as buildings, doorway, or pathways. Includes light and fixture. All materials and appurtenances included.	Each	$122.31	1	$122.31

Practice: 670 - Energy Efficient Lighting System

Scenario: #5 - Automatic Controller System

Scenario Description:

The typical scenario consists of an automatic control system installed on an existing manually controlled agricultural system. Typical components may include any of the following: wiring, sensors, data logger, logic controller, communication link, software, switches, and relay.

Before Situation:

A manually controlled system is existing in an agricultural facility that causes the inefficient use of energy, as evidenced by an on-farm energy audit.

After Situation:

An on-farm energy audit has determined that energy use can be reduced through use of an automatic controller that helps regulates the energy consumption of the existing system. Associated practices/activities may include: 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Each system

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $486.14

Scenario Cost/Unit: $486.14

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	4	$136.48
Materials						
Programable LED Dimmer	2720	Programable light dimmer/controller for poultry and hog barns - Includes material and shipping only	Each	$349.66	1	$349.66

Practice: 670 - Energy Efficient Lighting System

Scenario: #10 - Lighting - Replace Existing Lighting Fixture with Linear LED

Scenario Description:

To install low energy linear LED lighting system to replace existing less efficient lighting fixtures on a one-for-one basis. Associated materials for installation of replacement fixtures are included. Appropriate disposal of existing lamps, ballasts and other materials is required.

Before Situation:

An inefficient lighting system such as one using incandescent lamps has been identified by an on-farm energy audit.

After Situation:

More efficient lighting is provided by a linear Light-Emitting Diode (LED) fixture in order to reduce energy use as evidenced by the energy audit. The typical fixture installed is a low energy linear LED system which includes lamps and a fixture designed to withstand the environmental conditions where the system is installed. Associated practices/activities: 122-AgEMP - HQ and 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a CAP 122-Ag EMP - HQ or a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Each Lamp Replaced

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $75.75

Scenario Cost/Unit: $75.75

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	1	$34.12
Materials						
Lighting, LED (Linear)	2417	LED Strip/Shop Light - minimum 4000 Lumens; non-dimmable, dry location, 50,000 hour lifespan or greater. Materials and shipping only.	Each	$41.63	1	$41.63

Practice: 670 - Energy Efficient Lighting System

Scenario: #11 - Lighting - Replace Existing Lighting Fixture with High Intensity LED Flood

Scenario Description:

To install LED flood lighting system to replace existing less efficient lighting fixtures on a one-for-one basis. Associated materials for installation of replacement fixtures are included. Appropriate disposal of existing lamps, ballasts and other materials is required.

Before Situation:

An inefficient lighting system such as one using incandescent lamps has been identified by an on-farm energy audit.

After Situation:

More efficient lighting is provided by a Light-Emitting Diode (LED) flood lighting fixture in order to reduce energy use as evidenced by the energy audit. The typical fixture installed is a 100 watt light emitting diode (LED) with a 5700 Kelvin, 4,000 lumens flood lamp with an industrial grade fixture designed to withstand the environmental conditions where the system is installed. Associated practices/activities: 122-AgEMP - HQ and 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a CAP 122-Ag EMP - HQ or a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Each Lamp Replaced

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $313.02

Scenario Cost/Unit: $313.02

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	1	$34.12
Materials						
Lighting, Flood, LED Fixtures, Minimum 12,000 lumens, wet location	2390	light emitting diode (LED) flood light and fixture, minimum of 12,000 lumens, minimum lifespan of 50,000 hours; industrial grade with fixture; suitably protected from dirt accumulation and for wet location. Materials only.	Each	$278.90	1	$278.90

Practice: 672 - Energy Efficient Building Envelope

Scenario: #1 - Building Envelope - Attic Insulation

Scenario Description:

Install a minimum R-7 insulation in addition to existing attic or ceiling to reduce heat transfer. Increased insulation reduces seasonal heat loss and heat gain which reduces the respective need for heating and cooling equipment to operate.

Before Situation:

A poultry house with an inefficient building envelope with limited attic insulation.

After Situation:

A more effective and efficient building envelope can be created through addition of, or increased, attic insulation. Associated practices/activities: 122-AgEMP - HQ and 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Area of Attic Insulated

Scenario Unit: Square Feet

Scenario Typical Size: 20,000.0

Scenario Total Cost: $15,200.00

Scenario Cost/Unit: $0.76

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Materials						
Insulation, Fiberglass or cellulose, R-15	1196	Fiberglass or cellulose insulation R-15, includes materials, equipment and labor to install.	Square Feet	$0.76	20000	$15,200.00

Practice: 672 - Energy Efficient Building Envelope

Scenario: #2 - Building Envelope - Wall Insulation

Scenario Description:

Install insulation in uninsulated or underinsulated mechanically ventilated agricultural barns with a metal exterior with the use of fiberglass batts or spray polyurethane foam that includes a thermal barrier. The R-rating of the wall assembly must meet the requirements for the location. Option 1: Fiberglass batts (typically 3.5" and R-11), vapor barrier and interior plywood or OSB sheathing that meets thermal barrier requirements. Option 2) Use a closed cell polyurethane foam (typically 1" thick (R value 5-7) in accordance with manufacturer's recommendation, a thermal barrier (typically ¾" plywood or OSB), and vapor barrier if required. Thermal barriers exposed to animals shall protect the insulation or from animal destruction (such as peck boards for the bottom 2 feet of poultry houses).

Before Situation:

A mechanically ventilated agriculture barn with an inefficient building envelope with limited wall insulation.

After Situation:

A more effective and efficient building envelope can be created through addition of, or increased, insulation. Associated practices/activities: may include 128-Agricultural Energy Management Plan and 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Area of Attic Insulated

Scenario Unit: Square Feet

Scenario Typical Size: 4,500.0

Scenario Total Cost: $8,460.00

Scenario Cost/Unit: $1.88

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Materials						
Insulation, Panel, R-11 with sheathing	1197	Insulated wall panel typically 3.5 inch fiberglass batts (R-11), vapor barrier and OSB sheathing, or equal, includes materials, equipment and labor to install.	Square Feet	$1.88	4500	$8,460.00

Practice: 672 - Energy Efficient Building Envelope

Scenario: #3 - Building Envelope - Sealant

Scenario Description:

A typical scenario is sealing the gaps between walls, gables, ceiling, etc. in a poultry house or greenhouse. Sealing is performed by a professional contractor, not merely use of spray foam from a can. The unit basis of payment in this scenario is each house based on 60' x 500' poultry house with an assumed need of sealant to seal 2400 linear feet of gap.

Before Situation:

An agricultural facility with an inefficient building envelope with gaps between walls, ceiling, etc. for a total of 2400 linear feet.

After Situation:

A more effective and efficient building envelope can be created through interior sealing of the exterior walls at the footer plate, eaves, ridge cap, and gable ends. The sealant reduces seasonal heat loss and heat gain due to infiltration which reduces the respective need for heating and cooling equipment to operate. Associated practices/activities: may include 122-AgEMP - HQ and 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Perimeter of heated structure

Scenario Unit: Feet

Scenario Typical Size: 2,400.0

Scenario Total Cost: $4,032.00

Scenario Cost/Unit: $1.68

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Materials						
Sealant	1150	Greenhouse and building gap sealant. Performed by a professional contractor spraying the areas with an approved sealant for poultry production facilities. Includes materials, equipment and labor to install.	Feet	$1.68	2400	$4,032.00

Practice: 672 - Energy Efficient Building Envelope

Scenario: #5 - Greenhouse - Insulate Unglazed Walls

Scenario Description:

A typical scenario is the installation insulation in green house to address energy loss. The insulation can be either of the cellouse or bubble type (or equivalent). The increased insulation reduces seasonal heat loss and heat gain which reduces the respective need for heating and cooling equipment to operate.

Before Situation:

Green house with standard glazing, plastic or polycarbonate walls and no insulation. Heating and cooling of an existing greenhouse is inefficient due to excessive heat loss.

After Situation:

The greenhouse is fitted with insulation installed truss-to-truss or gutter-to-gutter and/or non glazed endwalls and/or sidewalls, reducing heat loss and gain in the greenhouse. Associated practices/activities: may include 122-AgEMP - HQ and 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Square Feet of insulation

Scenario Unit: Square Feet

Scenario Typical Size: 25,000.0

Scenario Total Cost: $8,295.92

Scenario Cost/Unit: $0.33

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	16	$545.92
Materials						
Insulation, Greenhouse, Reflective Bubble	2410	Double bubble reflective insulation with aluminum foil on both sides. Includes materials and shipping only.	Square Feet	$0.31	25000	$7,750.00

Practice: 672 - Energy Efficient Building Envelope

Scenario: #65 - Building Envelope - Greenhouse Screens

Scenario Description:

The mechanical energy screen system consists of a drive motor, support cables, controls, and shade material, which may be woven, knitted, or non-woven strips of aluminum fiber, polyethylene, nylon or other synthetic material. The screen provides a means to better control solar heat gain and heat transfer during night or cold weather conditions to reduce energy use. Screens and similar devices may also be used to divide internal areas and allow for differentiated heating, ventilation, or cooling system operation to reduce energy use.

Before Situation:

Heating and cooling of an existing greenhouse, or similar structure with conditioned spaces, is inefficient due to poorly regulated heat transfer. A need to regulate an entire space for uniform conditions when some portions have differing, intermittent requirements can also reduce efficiency.

After Situation:

The greenhouse is fitted with a mechanically controlled energy screen installed truss-to-truss or gutter-to-gutter, with side screens as necessary, reducing heat loss in the greenhouse. Associated practices/activities: may include 122-AgEMP - HQ and 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Area of Screen

Scenario Unit: Square Feet

Scenario Typical Size: 25,000.0

Scenario Total Cost: $57,545.92

Scenario Cost/Unit: $2.30

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	16	$545.92
Materials						
Thermal blanket 10,001 - 50,000 square foot	1148	Thermal blanket greenhouse screens: mechanical energy screen system consists of a drive motor, support cables, controls, and shade material, which may be woven, knitted, or non-woven. Size Range is 10,001 to 50,000 square feet. Materials only.	Square Feet	$2.28	25000	$57,000.00

Practice: 808 - Soil Carbon Amendment

Scenario: #53 - Biochar

Scenario Description:

This scenario is used to import and apply biochar of known origin, production methods, and nutrient content to land to reduce nutrient leaching and improve organic matter, aggregate stability, habitat for soil organisms, and plant productivity and health. Prior to application biochar analysis is provided and contains the content of carbon, nitrogen, phosphorus, potassium, and pH at a minimum. Prior to application, soil is tested for soil health using the NRCS Basic Soil Health Assessment that includes soil organic carbon.

Before Situation:

An in-field assessment and a basic laboratory soil health test indicates that soil organism habitat loss or degradation, aggregate instability or low organic matter levels are present and the addition of a carbon amendment is needed to contribute to the soil food web, improve aggregate stability and organic matter. Other soil tests or site evaluations indicate nutrient leaching or runoff is a concern.

After Situation:

Soil and biochar was tested and biochar was judiciously applied at rate of at least 1 ton/acre or 4 cu yd/acre. Soil carbon levels are improved by the addition of stable carbon, nitrate leaching is reduced and water holding capacity is improved. A follow up soil health test is planned using Soil Testing (216).

Feature Measure: Area

Scenario Unit: Acres

Scenario Typical Size: 20.0

Scenario Total Cost: $17,158.55

Scenario Cost/Unit: $857.93

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	20	$197.80
Manure, compost, application	955	Loading, hauling and spreading manure/compost by ground equipment. Includes equipment, power unit and labor costs.	Hours	$118.82	2	$237.64
Materials						
Test, Soil Health, Basic Package	2734	Basic soil health laboratory assessment for soil organic carbon, aggregation, bioavailable nitrogen, respiration, and active carbon according to technical note 450-03. Includes shipping and handling.	Number	$115.91	1	$115.91
Biochar	2743	Solid material obtained from thermochemical conversion of biomass in an oxygen-limited environment (pyrolysis). Biochar is typically produced from woody biomass, but other carbon sources may be used. Materials only.	Cubic Yards	$193.09	80	$15,447.20
Mobilization						
Aggregate, Shipping, Cubic Yard-mile	2360	Mobilization of aggregate material beyond 20 miles of local delivery from quarry to construction site. Cubic Yard-mile (Cubic Yard * miles of haul).	Cubic Yard Mile	$0.29	4000	$1,160.00

Practice: 808 - Soil Carbon Amendment

Scenario: #54 - Whole Orchard Recycling

Scenario Description:

On site grinding or chipping of whole trees during orchard removal and incorporation of the chips into the soil prior to replanting. On site grinding or chipping eliminates the need to burn trees or haul them away. Typically used for large one pass grinder-rototiller equipment or for spreading and incorporation operations.

Before Situation:

An orchard has reached the end of its lifespan and needs to be replanted.

After Situation:

Trees are ground or chipped. Wood chips are incorporated into the soil to increase soil organic carbon content. Soil structure and health is improved. Water use efficiency increases along with gains in infiltration, aggregation, and water holding capacity. A follow up soil health test is planned using Soil Testing (216).

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 10.0

Scenario Total Cost: $3,054.68

Scenario Cost/Unit: $305.47

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	10	$98.90
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acres	$15.10	20	$302.00
Manure, compost, application	955	Loading, hauling and spreading manure/compost by ground equipment. Includes equipment, power unit and labor costs.	Hours	$118.82	10	$1,188.20
Ripper or subsoiler, > 36 inch depth	1236	Deep ripper or subsoiler, (>36 inches depth) includes tillage implement, power unit and labor.	Acres	$53.23	10	$532.30
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	10	$264.60
Materials						
Test, Soil Health, Basic Package	2734	Basic soil health laboratory assessment for soil organic carbon, aggregation, bioavailable nitrogen, respiration, and active carbon according to technical note 450-03. Includes shipping and handling.	Number	$115.91	1	$115.91
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	2	$317.06
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: 808 - Soil Carbon Amendment

Scenario: #55 - Compost - Low Rate On-Farm

Scenario Description:

This scenario is typically used on large fields/acres at low rates (at least 1 ton/acre) where the primary use of compost is to improve soil biology. Compost is produced on-farm and applied to land to improve habitat for soil organisms as well as plant productivity and health. Prior to application, compost is tested according to the Test Methods for the Examination of Composting and Compost (TMECC), or by other Land Grant University (LGU) recognized methods. Soil is tested for soil health using the NRCS Basic Soil Health Assessment that includes soil organic carbon.

Before Situation:

An in-field assessment and a basic laboratory soil health test indicates that soil organism habitat loss or degradation is present and the addition of a carbon amendment is needed to contribute to the soil food web.

After Situation:

Soil compost was tested and is judiciously applied a low rate that will improve organism habitat and soil biology without creating unacceptable risk of N or P losses. A follow up soil health test is planned using Soil Testing (216).

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $7,497.68

Scenario Cost/Unit: $74.98

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Manure, compost, application	955	Loading, hauling and spreading manure/compost by ground equipment. Includes equipment, power unit and labor costs.	Hours	$118.82	25	$2,970.50
Manure, compost, application	955	Loading, hauling and spreading manure/compost by ground equipment. Includes equipment, power unit and labor costs.	Hours	$118.82	1	$118.82
Materials						
Compost	265	A mixture of decaying organic matter, as from leaves and manure, used to improve soil structure and provide nutrients.	Ton	$43.63	100	$4,363.00
Test, Compost Analysis	307	Moisture, Total N, P, K. Includes materials and shipping only.	Each	$45.36	1	$45.36

Practice: 808 - Soil Carbon Amendment

Scenario: #56 - Compost - Moderate Rate - On-Farm

Scenario Description:

This scenario is typically used to apply compost at moderate rates (at least 3 tons/acre) to maintain, increase or improve organic matter content, improve aggregate stability, habitat for soil organisms, and plant productivity and health. Compost is produced on-farm nutrient content is imported and applied to fields. Prior to application, compost is tested according to the Test Methods for the Examination of Composting and Compost (TMECC), or by other Land Grant University (LGU) recognized methods. Soil is tested for soil health using the NRCS Basic Soil Health Assessment that includes soil organic carbon.

Before Situation:

An in-field assessment and a basic laboratory soil health test indicates that soil organism habitat loss or degradation, aggregate instability or low organic matter levels are present and the addition of a carbon amendment is needed to contribute to the soil food web, improve aggregate stability and increase organic matter.

After Situation:

Soil was tested and compost is judiciously applied at a rate that will improve soil organic matter, aggregation and organism habitat without creating unacceptable risk of N or P loss. A follow up soil health test is planned using Soil Testing (216).

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 20.0

Scenario Total Cost: $3,491.99

Scenario Cost/Unit: $174.60

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Manure, compost, application	955	Loading, hauling and spreading manure/compost by ground equipment. Includes equipment, power unit and labor costs.	Hours	$118.82	6	$712.92
Materials						
Compost	265	A mixture of decaying organic matter, as from leaves and manure, used to improve soil structure and provide nutrients.	Ton	$43.63	60	$2,617.80
Test, Compost Analysis	307	Moisture, Total N, P, K. Includes materials and shipping only.	Each	$45.36	1	$45.36
Test, Soil Health, Basic Package	2734	Basic soil health laboratory assessment for soil organic carbon, aggregation, bioavailable nitrogen, respiration, and active carbon according to technical note 450-03. Includes shipping and handling.	Number	$115.91	1	$115.91

Practice: 808 - Soil Carbon Amendment

Scenario: #57 - Carbon By-Product - Imported

Scenario Description:

This scenario is primarily used for the application of different types of carbon amendments, such as sawdust, pulverized paper, bagasse, or distillation residue that are obtained at a negligible cost. The primary purpose of this scenario is facilitate transport and application of the by-product. Addition of the by-product directly improves the carbon content of the soil and improves soil health-related resource concerns.

Before Situation:

An in-field assessment and a basic laboratory soil health test indicates that soil organism habitat loss or degradation, aggregate instability or low organic matter levels are present and the addition of a carbon amendment is needed to contribute to the soil food web, improve aggregate stability and organic matter. Carbon by-products are available and transport and application of the by-product is needed.

After Situation:

Regionally appropriate carbon-based materials, such as wood chips, sawdust, pulverized paper, bagasse, or distillation residue were tested for nutrient content and applied to meet the conservation objective. A follow up soil health test is planned using Soil Testing (216).

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 20.0

Scenario Total Cost: $3,971.99

Scenario Cost/Unit: $198.60

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	20	$197.80
Manure, compost, application	955	Loading, hauling and spreading manure/compost by ground equipment. Includes equipment, power unit and labor costs.	Hours	$118.82	6	$712.92
Materials						
Test, Compost Analysis	307	Moisture, Total N, P, K. Includes materials and shipping only.	Each	$45.36	1	$45.36
Test, Soil Health, Basic Package	2734	Basic soil health laboratory assessment for soil organic carbon, aggregation, bioavailable nitrogen, respiration, and active carbon according to technical note 450-03. Includes shipping and handling.	Number	$115.91	1	$115.91
Mobilization						
Aggregate, Shipping, Cubic Yard-mile	2360	Mobilization of aggregate material beyond 20 miles of local delivery from quarry to construction site. Cubic Yard-mile (Cubic Yard * miles of haul).	Cubic Yard Mile	$0.29	10000	$2,900.00

Practice: 808 - Soil Carbon Amendment

Scenario: #58 - Compost - Low Rate - Imported

Scenario Description:

This scenario is typically used on large fields/acres at low rates (at least 1 ton/acre) where the primary use of compost is to improve soil biology. Compost of a known origin and nutrient content is imported and applied to land to improve habitat for soil organisms as well as plant productivity and health. Soil is tested for soil health using the NRCS Basic Soil Health Assessment that includes soil organic carbon.

Before Situation:

An in-field assessment and a basic laboratory soil health test indicates that soil organism habitat loss or degradation is present and the addition of a carbon amendment is needed to contribute to the soil food web.

After Situation:

Soil was tested and compost is judiciously applied a low rate that will improve organism habitat and soil biology without creating unacceptable risk of N or P losses. A follow up soil health test is planned using Soil Testing (216).

Feature Measure: Area

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $9,624.41

Scenario Cost/Unit: $96.24

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Manure, compost, application	955	Loading, hauling and spreading manure/compost by ground equipment. Includes equipment, power unit and labor costs.	Hours	$118.82	25	$2,970.50
Materials						
Compost	265	A mixture of decaying organic matter, as from leaves and manure, used to improve soil structure and provide nutrients.	Ton	$43.63	100	$4,363.00
Test, Soil Health, Basic Package	2734	Basic soil health laboratory assessment for soil organic carbon, aggregation, bioavailable nitrogen, respiration, and active carbon according to technical note 450-03. Includes shipping and handling.	Number	$115.91	1	$115.91
Mobilization						
Aggregate, Shipping, Cubic Yard-mile	2360	Mobilization of aggregate material beyond 20 miles of local delivery from quarry to construction site. Cubic Yard-mile (Cubic Yard * miles of haul).	Cubic Yard Mile	$0.29	7500	$2,175.00

Practice: 808 - Soil Carbon Amendment

Scenario: #59 - Compost - Moderate Rate - Imported

Scenario Description:

This scenario is typically used to apply compost at moderate rates (at least 3 tons/acre) to maintain, increase or improve organic matter content, improve aggregate stability, habitat for soil organisms, and plant productivity and health. Compost of a known origin and nutrient content is imported and applied to fields. Prior to application, soil is tested for soil health using the NRCS Basic Soil Health Assessment that includes soil organic carbon.

Before Situation:

An in-field assessment and a basic laboratory soil health test indicates that soil organism habitat loss or degradation, aggregate instability or low organic matter levels are present and the addition of a carbon amendment is needed to contribute to the soil food web, improve aggregate stability and increase organic matter.

After Situation:

Soil was tested and compost is judiciously applied at a rate that will improve soil organic matter, aggregation and organism habitat without creating unacceptable risk of N or P loss. A follow up soil health test is planned using Soil Testing (216).

Feature Measure: Area

Scenario Unit: Acres

Scenario Typical Size: 20.0

Scenario Total Cost: $4,780.63

Scenario Cost/Unit: $239.03

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Manure, compost, application	955	Loading, hauling and spreading manure/compost by ground equipment. Includes equipment, power unit and labor costs.	Hours	$118.82	6	$712.92
Materials						
Compost	265	A mixture of decaying organic matter, as from leaves and manure, used to improve soil structure and provide nutrients.	Ton	$43.63	60	$2,617.80
Test, Soil Health, Basic Package	2734	Basic soil health laboratory assessment for soil organic carbon, aggregation, bioavailable nitrogen, respiration, and active carbon according to technical note 450-03. Includes shipping and handling.	Number	$115.91	1	$115.91
Mobilization						
Aggregate, Shipping, Cubic Yard-mile	2360	Mobilization of aggregate material beyond 20 miles of local delivery from quarry to construction site. Cubic Yard-mile (Cubic Yard * miles of haul).	Cubic Yard Mile	$0.29	4600	$1,334.00

Practice: 808 - Soil Carbon Amendment

Scenario: #60 - Compost and Biochar Mix

Scenario Description:

This scenario is used to import compost and biochar mix that contains at least 10% biochar on a volume basis. Total compost and biochar application rate should be a minimum of 3 tons/acre or 6 cubic yards. Both materials are known origin, production methods and nutrient content. Mixture is applied to land to increase or improve organic matter content and improve aggregate stability, habitat for soil organisms, and plant productivity and health.

Before Situation:

An in-field assessment and a basic laboratory soil health test indicates that soil organism habitat loss or degradation, aggregate instability or low organic matter levels are present and the addition of a carbon amendment is needed to contribute to the soil food web, improve aggregate stability and organic matter.

After Situation:

Soil, compost, and biochar was tested. Biochar was mixed with compost at a minimum of 10% by volume basis. Soil health improved by the addition of stable carbon compost microorganism and water holding capacity is improved. A follow up soil health test is planned using Soil Testing (216).

Feature Measure: Area

Scenario Unit: Acres

Scenario Typical Size: 20.0

Scenario Total Cost: $6,592.57

Scenario Cost/Unit: $329.63

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	20	$197.80
Manure, compost, application	955	Loading, hauling and spreading manure/compost by ground equipment. Includes equipment, power unit and labor costs.	Hours	$118.82	4	$475.28
Materials						
Compost	265	A mixture of decaying organic matter, as from leaves and manure, used to improve soil structure and provide nutrients.	Ton	$43.63	50	$2,181.50
Test, Soil Health, Basic Package	2734	Basic soil health laboratory assessment for soil organic carbon, aggregation, bioavailable nitrogen, respiration, and active carbon according to technical note 450-03. Includes shipping and handling.	Number	$115.91	1	$115.91
Biochar	2743	Solid material obtained from thermochemical conversion of biomass in an oxygen-limited environment (pyrolysis). Biochar is typically produced from woody biomass, but other carbon sources may be used. Materials only.	Cubic Yards	$193.09	12	$2,317.08
Mobilization						
Aggregate, Shipping, Cubic Yard-mile	2360	Mobilization of aggregate material beyond 20 miles of local delivery from quarry to construction site. Cubic Yard-mile (Cubic Yard * miles of haul).	Cubic Yard Mile	$0.29	4500	$1,305.00

Practice: B000BFF1 - Buffer Bundle#1

Scenario: #1 - Buffer Bundle#1

Scenario Description:
Addresses water quality degradation, degraded plant condition, fish/wildlife inadequate habitat, and/or air quality impacts.

Before Situation:
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 3.0

Scenario Total Cost: $7,724.98

Scenario Cost/Unit: $2,574.99

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	8	$178.32
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	1	$9.89
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	7	$37.38
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	1	$20.31
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$21.30	6	$127.80
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$19.49	10	$194.90
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acres	$8.00	1	$8.00
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$11.47	10	$114.70
Mechanical tree planter	1600	Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor.	Hours	$5.49	6	$32.94
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$215.46	1.23	$265.02
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$248.06	1.08	$267.90
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acres	$121.05	0.69	$83.52
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	2	$68.24
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	16	$387.04
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	6	$158.76
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	6	$272.04
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	2	$222.42
Materials						

Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$9.21	5	$46.05
Herbicide, Sulfometuron & metsulfuron	344	A residual sulfonylurea herbicide that kills broadleaf weeds and some annual grasses. It is a systemic compound with foliar and soil activity. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$10.96	5	$54.80
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$1.51	5	$7.55
Shrub, Seedling, Medium	1507	Bare root shrub seedling, 18 to 36 inches tall; includes tropical containerized seedlings 10 to 20 cubic inches. Includes materials and shipping only.	Each	$1.41	341	$480.81
Tree, Hardwood, Seedling, Medium	1510	Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only.	Each	$1.52	2518	$3,827.36
Annual Grasses, Legumes or Forbs	2732	A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$47.95	1	$47.95
Native Perennial Grasses, Legumes and/or Forbs, Medium Density	2754	A mix of native perennial grasses, legumes, and/or forbs, grasses typically greater than 50% of the mix, mmay include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to higher density (41-60 pure live seeds/sq ft). Species typically easy to purchase. Includes material and shipping.	Acres	$258.50	1	$258.50
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	2	$317.06
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: B000CPL10 - YEAR 1 Irrigated Cropland (MRBI/Ogallala)

Scenario: #6 - YEAR 1 Irrigated Cropland (MRBI/Ogallala)

Scenario Description:
Addresses water quality degradation, insufficient water, soil erosion, and inefficient energy.

Before Situation:
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied

Feature Measure: acres of cropland where enhancem

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $13,906.51

Scenario Cost/Unit: $139.07

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	30	$668.70
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	19	$648.28
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	16	$725.44
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	41	$4,559.61
Materials						
Nitrogen-Urease inhibitor	260	Nitrogen-Urease inhibitor	Acres	$24.14	100	$2,414.00
Test, Soil Nitrogen Testing	311	Pre-Side Dress/Deep Soil Testing. Includes materials and shipping only.	Each	$9.35	5	$46.75
Switches and Controls, temp sensors	1192	Temperature and soil moisture sensors installed as part of an electronic monitoring (with or without wireless telecommunications) commonly used to control pumps and irrigation systems	Each	$579.54	3	$1,738.62
Data Logger with Telemetry System	1454	Data Logger W/Graphic Output for water management and telemetry - data communication device with power supply in a weather proof enclosure. Equipment only.	Each	$1,577.29	1	$1,577.29
Weather Station, Advanced	2550	Advance Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, temperature, and solar radiation from a solar powered self-standing tripod to an advance weather recording console. Used for both 449 advance irrigation water management and for Activity 202 water quality monitoring .	Each	$811.13	1	$811.13
Annual Grasses	2730	Annual grasses, one or more species, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$32.58	20	$651.60
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	1	$65.09

Practice: B000CPL11 - YEAR 2+ Irrigated Cropland (MRBI/Ogallala)

Scenario: #12 - YEAR 2+ Irrigated Cropland (MRBI/Ogallala)

Scenario Description:
Addresses water quality degradation, insufficient water, and soil erosion.

Before Situation:
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied.

Feature Measure: acres of cropland where enhancem

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $5,821.85

Scenario Cost/Unit: $58.22

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	41	$1,398.92
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	24	$1,088.16
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	2	$222.42
Materials						
Nitrogen-Urease inhibitor	260	Nitrogen-Urease inhibitor	Acres	$24.14	100	$2,414.00
Test, Soil Nitrogen Testing	311	Pre-Side Dress/Deep Soil Testing. Includes materials and shipping only.	Each	$9.35	5	$46.75
Annual Grasses	2730	Annual grasses, one or more species, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$32.58	20	$651.60

Practice: B000CPL18 - Crop Bundle #18 - Precision Ag

Scenario: #12 - Crop Bundle #18 - Precision Ag

Scenario Description:
Addresses water quality degradation, fish and wildlife inadequate habitat, air quality impairment, and either soil erosion or soil quality degradation resource concerns.

Before Situation:
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied

Feature Measure: acres of cropland where enhancem

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $3,616.72

Scenario Cost/Unit: $36.17

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, precision application	949	Chemical application performed by light bar/GPS navigation system. Includes equipment, power unit and labor costs.	Acres	$7.13	100	$713.00
Fertilizer, precision application	952	Fertilizer application performed by light bar/GPS navigation system. Includes equipment, power unit and labor costs.	Acres	$7.72	100	$772.00
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$215.46	0.17	$36.63
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$248.06	0.17	$42.17
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acres	$121.05	0.17	$20.58
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	1	$34.12
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	1	$45.34
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	8	$889.68
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$11.76	35	$411.60
Annual Grasses	2730	Annual grasses, one or more species, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$32.58	20	$651.60

Practice: B000CPL19 - Crop Bundle #19 - Soil Health Precision Ag

Scenario: #12 - Crop Bundle #19 - Soil Health Precision Ag

Scenario Description:
Addresses water quality degradation, soil quality degradation, fish and wildlife inadequate habitat, and insufficient water resource concerns.

Before Situation:
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied

Feature Measure: acres of cropland where enhancem

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $3,669.07

Scenario Cost/Unit: $36.69

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, precision application	949	Chemical application performed by light bar/GPS navigation system. Includes equipment, power unit and labor costs.	Acres	$7.13	100	$713.00
Fertilizer, precision application	952	Fertilizer application performed by light bar/GPS navigation system. Includes equipment, power unit and labor costs.	Acres	$7.72	100	$772.00
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	2	$68.24
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	13	$1,445.73
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$11.76	35	$411.60
Native Perennial Grasses, Legumes and/or Forbs, Medium Density	2754	A mix of native perennial grasses, legumes, and/or forbs, grasses typically greater than 50% of the mix, mmay include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to higher density (41-60 pure live seeds/sq ft). Species typically easy to purchase. Includes material and shipping.	Acres	$258.50	1	$258.50

Practice: B000CPL20 - Crop Bundle #20 - Soil Health Assessment

Scenario: #12 - Crop Bundle #20 - Soil Health Assessment

Scenario Description:
Addresses water quality degradation, soil quality degradation, fish and wildlife inadequate habitat, and insufficient water resource concerns.

Before Situation:
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied.

Feature Measure: acres of cropland where enhancem

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $5,084.45

Scenario Cost/Unit: $50.84

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	12	$409.44
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	16	$1,779.36
Materials						
Nitrogen-Urease inhibitor	260	Nitrogen-Urease inhibitor	Acres	$24.14	100	$2,414.00
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$11.76	15	$176.40
Test, Soil Nitrogen Testing	311	Pre-Side Dress/Deep Soil Testing. Includes materials and shipping only.	Each	$9.35	5	$46.75
Native Perennial Grasses, Legumes and/or Forbs, Medium Density	2754	A mix of native perennial grasses, legumes, and/or forbs, grasses typically greater than 50% of the mix, mmay include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to higher density (41-60 pure live seeds/sq ft). Species typically easy to purchase. Includes material and shipping.	Acres	$258.50	1	$258.50

Practice: B000CPL21 - Crop Bundle #21 - Crop Bundle (Organic)

Scenario: #12 - Crop Bundle #21 - Crop Bundle (Organic)

Scenario Description:
Addresses soil quality degradation, water quality degradation, and degraded plant condition resource concerns.

Before Situation:
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied.

Feature Measure: acres of cropland where enhancem

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $6,498.56

Scenario Cost/Unit: $64.99

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	10	$222.90
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	1	$9.89
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	2	$10.68
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	1	$20.31
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$19.49	10	$194.90
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acres	$8.00	1	$8.00
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$11.47	10	$114.70
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$215.46	0.82	$176.68
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$248.06	0.72	$178.60
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acres	$121.05	0.46	$55.68
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	10	$341.20
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	10	$241.90
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	9	$1,000.89
Materials						
Nitrogen-Urease inhibitor	260	Nitrogen-Urease inhibitor	Acres	$24.14	100	$2,414.00
Test, Soil Nitrogen Testing	311	Pre-Side Dress/Deep Soil Testing. Includes materials and shipping only.	Each	$9.35	5	$46.75
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$9.21	1	$9.21
Herbicide, Sulfometuron & metsulfuron	344	A residual sulfonylurea herbicide that kills broadleaf weeds and some annual grasses. It is a systemic compound with foliar and soil activity. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$10.96	1	$10.96

Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$1.51	1	$1.51
Shrub, Seedling, Medium	1507	Bare root shrub seedling, 18 to 36 inches tall; includes tropical containerized seedlings 10 to 20 cubic inches. Includes materials and shipping only.	Each	$1.41	341	$480.81
Tree, Hardwood, Seedling, Medium	1510	Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only.	Each	$1.52	340	$516.80
Annual Grasses, Legumes or Forbs	2732	A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$47.95	1	$47.95
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: B000CPL22 - Crop Bundle #22 - Erosion Bundle (Organic)

Scenario: #12 - Crop Bundle #22 - Erosion Bundle (Organic)

Scenario Description:
Addresses soil quality degradation, water quality degradation, soil erosion, and fish and wildlife inadequate habitat resource concerns.

Before Situation:
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied.

Feature Measure: acres of cropland where enhancem

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $5,371.35

Scenario Cost/Unit: $53.71

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	13	$443.56
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	14	$1,556.94
Materials						
Nitrogen-Urease inhibitor	260	Nitrogen-Urease inhibitor	Acres	$24.14	100	$2,414.00
Test, Soil Nitrogen Testing	311	Pre-Side Dress/Deep Soil Testing. Includes materials and shipping only.	Each	$9.35	5	$46.75
Annual Grasses	2730	Annual grasses, one or more species, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$32.58	20	$651.60
Native Perennial Grasses, Legumes and/or Forbs, Medium Density	2754	A mix of native perennial grasses, legumes, and/or forbs, grasses typically greater than 50% of the mix, mmay include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to higher density (41-60 pure live seeds/sq ft). Species typically easy to purchase. Includes material and shipping.	Acres	$258.50	1	$258.50

Practice: B000CPL23 - Crop Bundle #23 - Pheasant and quail habitat

Scenario: #5 - Crop Bundle #23 - Pheasant and quail habitat

Scenario Description:
Addresses wildlife inadequate habitat, water quality degradation and/or air quality impacts, and soil health and/or degraded plant condition.

Before Situation:
Resources are protected at the minimum level of the conservation practice standards applied as part of the bundle.

After Situation:
The adoption of these enhancements will provide resource protection above the minimum level of the conservation practice standard(s) applied

Feature Measure: Acres where the bundle is impleme

Scenario Unit: Acres

Scenario Typical Size: 40.0

Scenario Total Cost: $2,077.08

Scenario Cost/Unit: $51.93

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	1	$9.89
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	1	$5.34
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	1	$20.31
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$215.46	0.41	$88.34
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$248.06	0.36	$89.30
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acres	$121.05	0.23	$27.84
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	2	$68.24
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	2	$48.38
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	4	$444.84
Materials						
Annual Grasses, Legumes or Forbs	2732	A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$47.95	20	$959.00
Introduced Perennial Grasses, Legumes and/or Forbs, High Density	2749	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Includes material and shipping.	Acres	$57.10	1	$57.10
Native Perennial Grasses, Legumes and/or Forbs, Medium Density	2754	A mix of native perennial grasses, legumes, and/or forbs, grasses typically greater than 50% of the mix, mmay include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to higher density (41-60 pure live seeds/sq ft). Species typically easy to purchase. Includes material and shipping.	Acres	$258.50	1	$258.50

Practice: B000CPL24 - Crop Bundle #24 - Cropland Soil Health Management System

Scenario: #12 - Crop Bundle #24- Cropland Soil Health Management System

Scenario Description:
Addresses soil health, water quality (or water quality and air quality), and either soil erosion, soil compaction, or plant pest pressure.

Before Situation:
Resources are protected at the minimum level of the conservation practice standards applied as part of the bundle.

After Situation:
The adoption of these enhancements will provide resource protection above the minimum level of the conservation practice standard(s) applied.

Feature Measure: acre

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $4,317.75

Scenario Cost/Unit: $43.18

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	2	$68.24
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	14	$1,556.94
Materials						
Nitrogen-Urease inhibitor	260	Nitrogen-Urease inhibitor	Acres	$24.14	100	$2,414.00
Test, Soil Nitrogen Testing	311	Pre-Side Dress/Deep Soil Testing. Includes materials and shipping only.	Each	$9.35	5	$46.75
Test, Soil Health, Basic Package	2734	Basic soil health laboratory assessment for soil organic carbon, aggregation, bioavailable nitrogen, respiration, and active carbon according to technical note 450-03. Includes shipping and handling.	Number	$115.91	2	$231.82

Practice: B000FST1 - Forest Bundle#1

Scenario: #1 - Forest Bundle#1

Scenario Description:
Addresses forest management on sites that are not adapted to natural fire disturbances. Addresses resouce concerns air quality impacts, degraded plant condition and fish/wildlife inadequate habitat.

Before Situation:
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 111.0

Scenario Total Cost: $9,654.05

Scenario Cost/Unit: $86.97

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.59	45	$296.55
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	15	$334.35
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	1	$5.34
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hours	$66.08	41	$2,709.28
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$11.47	11	$126.17
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$215.46	0.41	$88.34
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$248.06	0.36	$89.30
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acres	$121.05	0.23	$27.84
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	7	$238.84
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	49	$1,185.31
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	12	$1,334.52
CAP Labor, forester	1302	Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage.	Hours	$76.26	17	$1,296.42
Materials						
Tree Marking Paint	313	Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only.	Acres	$8.78	20	$175.60
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$9.21	1	$9.21

Herbicide, Picloram	337	Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$18.17	21	$381.57
Herbicide, Sulfometuron & metsulfuron	344	A residual sulfonylurea herbicide that kills broadleaf weeds and some annual grasses. It is a systemic compound with foliar and soil activity. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$10.96	1	$10.96
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$1.51	1	$1.51
Shrub, Seedling, Medium	1507	Bare root shrub seedling, 18 to 36 inches tall; includes tropical containerized seedlings 10 to 20 cubic inches. Includes materials and shipping only.	Each	$1.41	605	$853.05
Tree, Hardwood, Seedling, Medium	1510	Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only.	Each	$1.52	218	$331.36
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53

Practice: B000GRZ1 - Grazing Bundle 1 - Range and Pasture

Scenario: #12 - Grazing Bundle 1 - Range and Pasture

Scenario Description:
This bundle addresses soil erosion, degraded plant condition, and fish and wildlife inadequate habitat resource concerns through adoption of enhancements E528L, E315A, and E645A.

Before Situation:
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied.

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 40.0

Scenario Total Cost: $3,253.02

Scenario Cost/Unit: $81.33

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$109.25	1	$109.25
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	24	$534.96
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hours	$66.08	2	$132.16
Trailer, enclosed, small	1503	Small enclosed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included.	Hours	$10.75	24	$258.00
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$18.46	10	$184.60
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	58	$1,403.02
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	2	$90.68
Materials						
Wire, Polywire	8	Wire, Polywire for electric fence - 1,300 ft. Includes materials and shipping only.	Each	$51.47	1	$51.47
Electric, Energizer, Solar	27	Electric, Energizer, Solar for electric fence. Includes materials and shipping only.	Each	$330.35	1	$330.35
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53

Practice: B000GRZ2 - Grazing Bundle 2 - Range and Pasture

Scenario: #12 - Grazing Bundle 2 - Range and Pasture

Scenario Description:
This bundle addresses water quality degradation, fish and wildlife inadequate habitat, and soil erosion resource concerns through adoption of enhancements E472A, E382A, and E580A.

Before Situation:
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied.

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 3.5

Scenario Total Cost: $7,334.06

Scenario Cost/Unit: $2,095.45

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hours	$11.75	5	$58.75
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	13	$289.77
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$21.30	5	$106.50
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$19.49	9	$175.41
Trailer, enclosed, small	1503	Small enclosed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included.	Hours	$10.75	8	$86.00
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$11.47	8	$91.76
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	81	$1,959.39
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	5	$132.30
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	8	$362.72
Materials						
Wire, Barbed, Galvanized, 12.5 Gauge, 1,320' roll	1	Galvanized 12.5 gauge, 1,320' roll. Includes materials and shipping only.	Each	$71.04	4	$284.16
Post, Wood, CCA treated, 3-4 in. x 7 ft.	9	Wood Post, Line 3-4 inch dia. X 7 ft., CCA Treated. Includes materials and shipping only.	Each	$7.36	20	$147.20
Post, Wood, CCA treated, 6 in. x 8 ft.	12	Wood Post, End 6 inch dia. X 8 ft., CCA Treated. Includes materials and shipping only.	Each	$17.21	8	$137.68
Post, Steel T, 1.33 lbs, 6'	15	Steel Post, Studded 6' - 1.33 lb. Includes materials and shipping only.	Each	$5.60	90	$504.00
Fence, Wire Assembly, Barbed Wire	30	Brace pins, battens, clips, staples. Includes materials and shipping only.	Feet	$0.19	1320	$250.80
Vinyl Undersill Strips	241	Marking material using the undersill strips of vinyl siding. Priced per foot of fence per each wire. Materials only.	Feet	$0.07	2000	$140.00
Gate, Pipe, 12 ft.	1057	6 rail tube gate, 16 gauge. Includes materials and shipping only.	Each	$179.02	2	$358.04
Shrub, Potted, Small	1524	Potted shrub seedling, 1 quart to 1 gallon. Includes materials and shipping only.	Each	$6.41	65	$416.65
Tree, Hardwood, Potted, Small	1529	Potted hardwood seedling, 1 quart to 1 gallon. Includes materials and shipping only.	Each	$7.78	65	$505.70
Tree, Conifer, Potted, Small	1534	Potted conifer seedling, 1 quart to 1 gallon. Includes materials and shipping only.	Each	$5.71	65	$371.15

Tree shelter, mesh tree tube, 48 in.	1556	48 inch tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only.	Each	$1.02	65	$66.30
Tree shelter, solid tube type, 4 in. x 24 in.	1563	4 inch x 24 inch tree tube for protection from animal damage. Materials only.	Each	$2.05	65	$133.25
Tree shelter, solid tube type, 4 in. x 48 in.	1566	4 inch x 48 inch tree tube for protection from animal damage. Materials only.	Each	$4.22	65	$274.30
Stakes, wood, 1 in. x 1 in. x 48 in.	1578	1 in. x 1 in. x 48 in. wood stakes to fasten items in place. Includes materials only.	Each	$1.66	195	$323.70
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53

Practice: B000GRZ3 - Grazing Bundle 3 - Range and Pasture

Scenario: #12 - Grazing Bundle 3 - Range and Pasture

Scenario Description:
This bundle addresses water quality degradation, fish and wildlife inadequate habitat, and soil erosion resource concerns through adoption of enhancements E472A, E390B, and E580A.

Before Situation:
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied.

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 6.0

Scenario Total Cost: $8,332.79

Scenario Cost/Unit: $1,388.80

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hours	$11.75	5	$58.75
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	13	$289.77
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	4	$21.36
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	2	$40.62
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$21.30	5	$106.50
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$19.49	8	$155.92
Trailer, enclosed, small	1503	Small enclosed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included.	Hours	$10.75	8	$86.00
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$11.47	8	$91.76
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$215.46	0.82	$176.68
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$248.06	0.72	$178.60
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acres	$121.05	0.46	$55.68
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	81	$1,959.39
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	5	$132.30
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	8	$362.72
Materials						
Wire, Barbed, Galvanized, 12.5 Gauge, 1,320' roll	1	Galvanized 12.5 gauge, 1,320' roll. Includes materials and shipping only.	Each	$71.04	4	$284.16
Post, Wood, CCA treated, 3-4 in. x 7 ft.	9	Wood Post, Line 3-4 inch dia. X 7 ft., CCA Treated. Includes materials and shipping only.	Each	$7.36	20	$147.20
Post, Wood, CCA treated, 6 in. x 8 ft.	12	Wood Post, End 6 inch dia. X 8 ft., CCA Treated. Includes materials and shipping only.	Each	$17.21	8	$137.68
Post, Steel T, 1.33 lbs, 6'	15	Steel Post, Studded 6' - 1.33 lb. Includes materials and shipping only.	Each	$5.60	90	$504.00
Fence, Wire Assembly, Barbed Wire	30	Brace pins, battens, clips, staples. Includes materials and shipping only.	Feet	$0.19	1320	$250.80

Herbicide, Imazapyr	336	Pre and post-emergent, non-selective herbicide for control of undesirable vegetation in non-crop areas. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$42.07	4	$168.28
Gate, Pipe, 12 ft.	1057	6 rail tube gate, 16 gauge. Includes materials and shipping only.	Each	$179.02	2	$358.04
Shrub, Potted, Small	1524	Potted shrub seedling, 1 quart to 1 gallon. Includes materials and shipping only.	Each	$6.41	65	$416.65
Tree, Hardwood, Potted, Small	1529	Potted hardwood seedling, 1 quart to 1 gallon. Includes materials and shipping only.	Each	$7.78	65	$505.70
Tree, Conifer, Potted, Small	1534	Potted conifer seedling, 1 quart to 1 gallon. Includes materials and shipping only.	Each	$5.71	65	$371.15
Tree shelter, mesh tree tube, 48 in.	1556	48 inch tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only.	Each	$1.02	65	$66.30
Tree shelter, solid tube type, 4 in. x 24 in.	1563	4 inch x 24 inch tree tube for protection from animal damage. Materials only.	Each	$2.05	65	$133.25
Tree shelter, solid tube type, 4 in. x 48 in.	1566	4 inch x 48 inch tree tube for protection from animal damage. Materials only.	Each	$4.22	65	$274.30
Stakes, wood, 1 in. x 1 in. x 48 in.	1578	1 in. x 1 in. x 48 in. wood stakes to fasten items in place. Includes materials only.	Each	$1.66	195	$323.70
Native Perennial Grasses, Legumes and/or Forbs, Medium Density	2754	A mix of native perennial grasses, legumes, and/or forbs, grasses typically greater than 50% of the mix, mmay include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to higher density (41-60 pure live seeds/sq ft). Species typically easy to purchase. Includes material and shipping.	Acres	$258.50	2	$517.00
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53

Practice: B000GRZ4 - Grazing Bundle 4 - Range and Pasture

Scenario: #12 - Grazing Bundle 4 - Range and Pasture

Scenario Description:
This bundle addresses water quality degradation, fish and wildlife inadequate habitat, and soil erosion resource concerns through adoption of enhancements E472A, E391C, and E580A.

Before Situation:
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied.

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 4.0

Scenario Total Cost: $10,625.14

Scenario Cost/Unit: $2,656.29

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hours	$11.75	5	$58.75
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	29	$646.41
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hours	$46.50	2	$93.00
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	2	$10.68
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$21.30	9	$191.70
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$19.49	8	$155.92
Trailer, enclosed, small	1503	Small enclosed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included.	Hours	$10.75	8	$86.00
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$11.47	24	$275.28
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$215.46	0.82	$176.68
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$248.06	0.72	$178.60
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acres	$121.05	0.46	$55.68
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	99	$2,394.81
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	9	$238.14
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	12	$544.08
Materials						
Wire, Barbed, Galvanized, 12.5 Gauge, 1,320' roll	1	Galvanized 12.5 gauge, 1,320' roll. Includes materials and shipping only.	Each	$71.04	4	$284.16
Post, Wood, CCA treated, 3-4 in. x 7 ft.	9	Wood Post, Line 3-4 inch dia. X 7 ft., CCA Treated. Includes materials and shipping only.	Each	$7.36	20	$147.20
Post, Wood, CCA treated, 6 in. x 8 ft.	12	Wood Post, End 6 inch dia. X 8 ft., CCA Treated. Includes materials and shipping only.	Each	$17.21	8	$137.68
Post, Steel T, 1.33 lbs, 6'	15	Steel Post, Studded 6' - 1.33 lb. Includes materials and shipping only.	Each	$5.60	90	$504.00
Fence, Wire Assembly, Barbed Wire	30	Brace pins, battens, clips, staples. Includes materials and shipping only.	Feet	$0.19	1320	$250.80

Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$9.21	1	$9.21
Herbicide, Sulfometuron & metsulfuron	344	A residual sulfonylurea herbicide that kills broadleaf weeds and some annual grasses. It is a systemic compound with foliar and soil activity. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$10.96	1	$10.96
Gate, Pipe, 12 ft.	1057	6 rail tube gate, 16 gauge. Includes materials and shipping only.	Each	$179.02	2	$358.04
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$1.51	1	$1.51
Tree, Hardwood, Seedling, Medium	1510	Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only.	Each	$1.52	872	$1,325.44
Shrub, Potted, Small	1524	Potted shrub seedling, 1 quart to 1 gallon. Includes materials and shipping only.	Each	$6.41	65	$416.65
Tree, Conifer, Potted, Small	1534	Potted conifer seedling, 1 quart to 1 gallon. Includes materials and shipping only.	Each	$5.71	65	$371.15
Tree shelter, mesh tree tube, 48 in.	1556	48 inch tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only.	Each	$1.02	65	$66.30
Tree shelter, solid tube type, 4 in. x 24 in.	1563	4 inch x 24 inch tree tube for protection from animal damage. Materials only.	Each	$2.05	65	$133.25
Tree shelter, solid tube type, 4 in. x 48 in.	1566	4 inch x 48 inch tree tube for protection from animal damage. Materials only.	Each	$4.22	165	$696.30
Stakes, wood, 1 in. x 1 in. x 48 in.	1578	1 in. x 1 in. x 48 in. wood stakes to fasten items in place. Includes materials only.	Each	$1.66	295	$489.70
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	2	$317.06

Practice: B000GRZ5 - Grazing Bundle 5 - Range and Pasture

Scenario: #12 - Grazing Bundle 5 - Range and Pasture

Scenario Description:
This bundle addresses livestock production limitation, degraded plant condition, and fish and wildlife inadequate habitat resource concerns through adoption of enhancements E528A, E315A, and E645A.

Before Situation:
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied.

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 1,050.0

Scenario Total Cost: $5,834.29

Scenario Cost/Unit: $5.56

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$109.25	1	$109.25
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	28	$624.12
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hours	$66.08	2	$132.16
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$19.49	12	$233.88
Trailer, enclosed, small	1503	Small enclosed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included.	Hours	$10.75	24	$258.00
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$18.46	36	$664.56
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	65	$1,572.35
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	2	$90.68
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	12	$1,334.52
Materials						
Wire, Polywire	8	Wire, Polywire for electric fence - 1,300 ft. Includes materials and shipping only.	Each	$51.47	1	$51.47
Electric, Energizer, Solar	27	Electric, Energizer, Solar for electric fence. Includes materials and shipping only.	Each	$330.35	1	$330.35
Tank, Polyethylene, 300 gallon	291	Portable heavy duty rubber stock tank.	Each	$274.42	1	$274.42
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53

Practice: B000PST5 - Pasture Bundle 5

Scenario: #12 - Pasture Bundle #5

Scenario Description:
Implementation of site specific strategies applied to range or pasture land uses through adoption of the following CSP enhancements: E528J, E315A, and E645A.

Before Situation:
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

After Situation:
Adoption of these bundled enhancements provides a combined benefit for resource protection that exceeds the minimum level for the associated practice standards in order to address the resource concerns Soil Erosion or Water Quality Degradation, Degraded Plant Condition, and Fish and Wildlife Inadequate Habitat.

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 60.0

Scenario Total Cost: $3,518.04

Scenario Cost/Unit: $58.63

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$109.25	1	$109.25
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	24	$534.96
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hours	$66.08	2	$132.16
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$19.49	6	$116.94
Trailer, enclosed, small	1503	Small enclosed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included.	Hours	$10.75	24	$258.00
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$18.46	6	$110.76
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	56	$1,354.64
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	2	$90.68
Materials						
Wire, Polywire	8	Wire, Polywire for electric fence - 1,300 ft. Includes materials and shipping only.	Each	$51.47	4	$205.88
Electric, Energizer, Solar	27	Electric, Energizer, Solar for electric fence. Includes materials and shipping only.	Each	$330.35	1	$330.35
Tank, Polyethylene, 300 gallon	291	Portable heavy duty rubber stock tank.	Each	$274.42	1	$274.42

Practice: B000RNG4 - Range Bundle 4

Scenario: #12 - Range Bundle #4

Scenario Description:
Implementation of site specific strategies applied to range through adoption of the following CSP enhancements: E528N, E315A, and E645A.

Before Situation:
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

After Situation:
Adoption of these bundled enhancements provides a combined benefit for resource protection that exceeds the minimum level for the associated practice standards in order to address the resource concerns Soil Erosion, Degraded Plant Condition, and Fish and Wildlife Inadequate Habitat.

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 50.0

Scenario Total Cost: $4,109.19

Scenario Cost/Unit: $82.18

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$109.25	1	$109.25
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	24	$534.96
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hours	$66.08	2	$132.16
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$19.49	8	$155.92
Trailer, enclosed, small	1503	Small enclosed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included.	Hours	$10.75	24	$258.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	58	$1,403.02
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	4	$181.36
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	12	$1,334.52

Practice: E300EAP1 - Existing Activity Payment-Land Use

Scenario: #16 - CSP EAP Cropland and Farmstead

Scenario Description:

This existing activity payment component (EAP1) provides a CSP participant with a payment for existing stewardship specific to the land uses included in the operation. This scenario covers the land uses cropland and farmstead.

Before Situation:

Producer implements conservation activities on cropland or farmstead to achieve a base level of stewardship.

After Situation:

Through participation in the CSP, the producer continues to maintain or improve the base level of stewardship assessed at the time of enrollment.

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 1.0

Scenario Total Cost: $7.50

Scenario Cost/Unit: $7.50

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
EAP - Cropland/Farmstead	2737	Existing Activity Payment for Cropland or Farmstead land use.	Acres	$7.50	1	$7.50

Practice: E300EAP1 - Existing Activity Payment-Land Use

Scenario: #35 - CSP EAP Range

Scenario Description:

This existing activity payment component (EAP1) provides a CSP participant with a payment for existing stewardship specific to the land uses included in the operation. This scenario covers the land use range.

Before Situation:

Producer implements conservation activities on range to achieve a base level of stewardship.

After Situation:

Through participation in the CSP, the producer continues to maintain or improve the base level of stewardship assessed at the time of enrollment.

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 1.0

Scenario Total Cost: $1.00

Scenario Cost/Unit: $1.00

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
EAP - Range	2739	Existing Activity Payment for Range land use.	Acres	$1.00	1	$1.00

Practice: E300EAP1 - Existing Activity Payment-Land Use

Scenario: #51 - CSP EAP NIPF

Scenario Description:

This existing activity payment component (EAP1) provides a CSP participant with a payment for existing stewardship specific to the land uses included in the operation. This scenario covers the land uses non-industrial private forest land (NIPF).

Before Situation:

Producer implements conservation activities on NIPF to achieve a base level of stewardship.

After Situation:

Through participation in the CSP, the producer continues to maintain or improve the base level of stewardship assessed at the time of enrollment.

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 1.0

Scenario Total Cost: $0.50

Scenario Cost/Unit: $0.50

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
EAP - Non-Industrial Private Forestland (NIPF)	2740	Existing Activity Payment for Non-Industrial Private Forestland (NIPF).	Acres	$0.50	1	$0.50

Practice: E300EAP1 - Existing Activity Payment-Land Use

Scenario: #67 - CSP EAP AAL

Scenario Description:

This existing activity payment component (EAP1) provides a CSP participant with a payment for existing stewardship specific to the land uses included in the operation. This scenario covers the land use associated agricultural land (AAL).

Before Situation:

Producer implements conservation activities on AAL to achieve a base level of stewardship.

After Situation:

Through participation in the CSP, the producer continues to maintain or improve the base level of stewardship assessed at the time of enrollment.

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 1.0

Scenario Total Cost: $0.50

Scenario Cost/Unit: $0.50

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
EAP - Associated Agricultural Land (AAL)	2741	Existing Activity Payment for Associated Agricultural Land (AAL)	Acres	$0.50	1	$0.50

Practice: E300EAP1 - Existing Activity Payment-Land Use

Scenario: #76 - CSP EAP Pasture

Scenario Description:

This existing activity payment component (EAP1) provides a CSP participant with a payment for existing stewardship specific to the land uses included in the operation. This scenario covers the land use pasture.

Before Situation:

Producer implements conservation activities on pasture to achieve a base level of stewardship.

After Situation:

Through participation in the CSP, the producer continues to maintain or improve the base level of stewardship assessed at the time of enrollment.

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 1.0

Scenario Total Cost: $3.00

Scenario Cost/Unit: $3.00

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
EAP - Pasture	2738	Existing Activity Payment for Pasture land use.	Acres	$3.00	1	$3.00

Practice: E300EAP2 - Existing Activity Payment-Resource Concern

Scenario: #12 - CSP EAP RC met at time of enrollment

Scenario Description:

This existing activity payment component (EAP2) provides a CSP participant with a payment for existing stewardship specific to the number of resource concerns met at the time of enrollment.

Before Situation:

Producer implements conservation activities across all land uses included in the operation to meet a minimum of two resource concerns at the time of enrollment.

After Situation:

Through participation in the CSP, the producer continues to maintain or improve the resource concerns met at the time of enrollment.

Feature Measure: Resource Concern Met

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $300.00

Scenario Cost/Unit: $300.00

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
EAP - Resource Concern	2742	Existing Activity Payment for Resource Concern(s).	Number	$300.00	1	$300.00

Practice: E300GCI - Grassland Conservation Initiative

Scenario: #12 - Grassland Conservation Initiative Activity

Scenario Description:

The Grassland Conservation Initiative Activity assists producers in protecting grazing uses; conserving and improving soil, water, and wildlife resources; and achieving related conservation values by conserving eligible land through grassland conservation contracts. Producers participating in the GCI must agree to meet or exceed planning criteria for at least one of the priority resource concerns: Soil Erosion, Soil Quality Degradation, Water Quality Degradation, Fish and Wildlife Habitat Improvement, Air Quality Impacts, Degraded Plant Condition, and/or Livestock Production Limitation.

Before Situation:

Eligible base acres have been maintained and reported as grass, idle, or fallow for all years between January 2009 and December 2017.

After Situation:

Through participation in the GCI, the producer will meet or exceed the planning criteria for at least one priority resource concern by managing the enrolled land to maintain grassland values even if the producer chooses to plant a crop on the enrolled acres.

Feature Measure: Acres

Scenario Unit: Acres

Scenario Typical Size: 1.0

Scenario Total Cost: $18.00

Scenario Cost/Unit: $18.00

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Grassland Conservation Initiative - Labor	2736	Labor to assist producers protect grazing uses through grassland conservation contracts.	Acres	$18.00	1	$18.00

Practice: E314A - Brush management to improve wildlife habitat

Scenario: #1 - Brush management to improve wildlife habitat

Scenario Description:

Brush management is employed to create a desired plant community, consistent with the related ecological site steady state, which will maintain or enhance the wildlife habitat desired for the identified wildlife species. It will be designed to provide plant structure, density and diversity needed to meet those habitat objectives. This enhancement does not apply to removal of woody vegetation by prescribed fire or removal of woody vegetation to facilitate a land use change.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 314 - Brush Management

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 314 - Brush Management

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $1,785.33

Scenario Cost/Unit: $17.85

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$109.25	1	$109.25
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$18.46	12	$221.52
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	32	$1,091.84
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	8	$362.72

Practice: E315A - Herbaceous weed treatment to create plant communities consistent with the ecological site

Scenario: #1 - Herbaceous weed treatment to create plant communities consistent with the ecological site

Scenario Description:

Mechanical, chemical, or biological, herbaceous weed treatment will be employed to control targeted, herbaceous weeds so as to create, release, or restore desired plant communities that are consistent with achievable, ecological site, steady state descriptions.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 315 - Herbaceous Weed Control

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 315 - Herbaceous Weed Control

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 10.0

Scenario Total Cost: $132.16

Scenario Cost/Unit: $13.22

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hours	$66.08	2	$132.16

Practice: E327A - Conservation cover for pollinators and beneficial insects

Scenario: #1 - Conservation cover for pollinators and beneficial insects

Scenario Description:

Seed or plug nectar and pollen producing plants in non-cropped areas such as field borders, vegetative barriers, contour buffer strips, grassed waterways, shelterbelts, hedgerows, windbreaks, conservation cover, and riparian forest and herbaceous buffers.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 327 - Conservation Cover

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 327 - Conservation Cover

Feature Measure: acre

Scenario Unit: Acres

Scenario Typical Size: 1.0

Scenario Total Cost: $150.03

Scenario Cost/Unit: $150.03

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	1	$34.12
Materials						
Test, Soil Health, Basic Package	2734	Basic soil health laboratory assessment for soil organic carbon, aggregation, bioavailable nitrogen, respiration, and active carbon according to technical note 450-03. Includes shipping and handling.	Number	$115.91	1	$115.91

Practice: E327B - Establish Monarch butterfly habitat

Scenario: #1 - Establish Monarch butterfly habitat

Scenario Description:
Seed or plug milkweed (Asclepias spp.), and high-value monarch butterfly nectar plants on marginal cropland, field borders, contour buffer strips, and similar areas.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 327 - Conservation Cover

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 327 - Conservation Cover

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 1.0

Scenario Total Cost: $847.33

Scenario Cost/Unit: $847.33

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hours	$46.50	1	$46.50
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hours	$66.08	2	$132.16
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acres	$8.00	1	$8.00
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	2	$90.68
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	1	$111.21
Materials						
Native Perennial Grasses, Legumes and/or Forb Mix for Targeted Wildlife/Pollinator Habitat or Ecological Restoration, moderate commercial availability	2619	Diverse mix of native perennial grasses, legumes and forbs, less than 50% grasses, may include biennials and a small percentage of annual species for establishment purposes and/or if allowed by the CPS. This is a mix composed of species required to meet specific wildlife/pollinator habitat or ecological requirements. Seed is moderately easy to purchase commercially. Includes materials and shipping.	Acres	$458.78	1	$458.78

Practice: E328A - Resource conserving crop rotation

Scenario: #1 - Resource conserving crop rotation

Scenario Description:

Establish a Resource Conserving Crop Rotation. Rotation must include AT LEAST one resource conserving crop as determined by the State Conservationist in a minimum three year crop rotation. The crop rotation will reduce soil erosion (water and wind), improve soil health, improve soil moisture efficiency, and reduce plant pest pressures.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $1,556.94

Scenario Cost/Unit: $15.57

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	14	$1,556.94

Practice: E328B - Improved resource conserving crop rotation

Scenario: #1 - Improved resource conserving crop rotation

Scenario Description:

Improve an existing Resource Conserving Crop Rotation. Must enrich an existing rotation which already includes AT LEAST one resource conserving crop as determined by the State Conservationist in a minimum three year crop rotation. The crop rotation will reduce soil erosion (water and wind), improve soil health, improve soil moisture efficiency, and reduce plant pest pressures.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $556.05

Scenario Cost/Unit: $5.56

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	5	$556.05

Practice: E328C - Conservation crop rotation on recently converted CRP grass/legume cover

Scenario: #1 - Conservation crop rotation on recently converted CRP grass/legume cover for water erosion

Scenario Description:

Implement a crop rotation management system on crop land acres that have recently converted from CRP grass/legume conservation cover to annual planted crops. Crop rotation minimizes disturbance resulting in a Soil Tillage Intensity Rating (STIR) less than 10 and reduces soil erosion from water or wind to below soil tolerance (T) level. The current NRCS wind and water erosion prediction technologies must be used to document the rotation, soil erosion estimate, and STIR calculations. *This enhancement is limited to acres where the conversion event took place not more than 2 years prior. Enhancement not applicable on hayland.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $333.63

Scenario Cost/Unit: $3.34

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	3	$333.63

Practice: E328D - Leave standing grain crops unharvested to benefit wildlife

Scenario: #1 - Leave standing grain crops unharvested to benefit wildlife

Scenario Description:
Implement a crop rotation which allows a portion of grain crops to be left in fields un-harvested to provide food and cover for wildlife during winter months.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 40.0

Scenario Total Cost: $144.72

Scenario Cost/Unit: $3.62

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$215.46	0.17	$36.63
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$248.06	0.17	$42.17
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acres	$121.05	0.17	$20.58
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	1	$45.34

Practice: E328E - Soil health crop rotation

Scenario: #1 - Soil health crop rotation

Scenario Description:

Implement a crop rotation which addresses all four principle components of soil health: increases diversity of the cropping system; maintains residue throughout the year; keeps a living root; and minimizes soil chemical, physical and biological disturbance. The rotation will include at least 4 different crop and/or cover crop types (crop types include cool season grass, warm season grass, cool season broadleaf, warm season broadleaf) grown in a sequence that will produce a positive trend in the Organic Matter (OM) sub factor value over the life of the rotation, as determined by the Soil Conditioning Index (SCI). The current NRCS wind and water erosion prediction technologies must be used to document the rotation and SCI calculations.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $556.05

Scenario Cost/Unit: $5.56

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	5	$556.05

Practice: E328F - Modifications to improve soil health and increase soil organic matter

Scenario: #1 - Modifications to improve soil health and increase soil organic matter

Scenario Description:

Use of soil health assessment to evaluate impact of current conservation crop rotation in addressing soil organic matter depletion (primary assessment made in Year 1). Modifications to the crop rotation and/or crop management will be made as a result of the assessment results (adding a new crop and/or cover crop to the rotation; making changes to planting and/or tillage system, harvest timing of crops, or termination timing of cover crops). During Year 3 a follow up assessment will be completed to allow time for the modifications to show increased soil organic matter. Modified system must produce a positive trend in the Organic Matter (OM) sub factor value over the life of the rotation, as determined by the Soil Conditioning Index (SCI). The current NRCS wind and water erosion prediction technologies must be used to document the rotation and SCI calculations.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $227.12

Scenario Cost/Unit: $2.27

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	1	$111.21
Materials						
Test, Soil Health, Basic Package	2734	Basic soil health laboratory assessment for soil organic carbon, aggregation, bioavailable nitrogen, respiration, and active carbon according to technical note 450-03. Includes shipping and handling.	Number	$115.91	1	$115.91

Practice: E328G - Crop rotation on recently converted CRP grass/legume cover for soil organic matter improvement

Scenario: #1 - Crop rotation on recently converted CRP grass/legume cover for soil organic matter improvement

Scenario Description:

Crop rotation on acres converted, no more than 2 years prior, from CRP grass/legume cover to annual crops. Diverse rotation with living roots and residue cover throughout year and minimal disturbance. Enhancement not applicable on hayland.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $556.05

Scenario Cost/Unit: $5.56

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	5	$556.05

Practice: E328H - Conservation crop rotation to reduce the concentration of salts

Scenario: #1 - Conservation crop rotation to reduce the concentration of salts

Scenario Description:

Implement a crop rotation to reduce the concentration of salts and other chemicals from saline seeps. The rotation should include at least 3 crops and/or cover crops grown in a sequence in the recharge areas of saline seeps that have rooting depths and water requirements adequate to fully utilize all available soil water. Do not use summer fallow. Use an approved water balance procedure to determine crop selection and sequence. Select crops with a tolerance to salinity levels that match the salinity of the discharge area. (See state lists)

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $444.84

Scenario Cost/Unit: $4.45

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	4	$444.84

Practice: E328I - Forage harvest to reduce water quality impacts by utilization of excess soil nutrients

Scenario: #1 - Forage harvest to reduce water quality impacts by utilization of excess soil nutrients

Scenario Description:

Establish a forage crop (single species or mix) following a primary annual crop to take up excess soil nutrients. Select forage known to effectively utilize and scavenge nutrients. Forage shall be harvested for forage, but not be grazed or burned.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

Feature Measure: Acres of Cropland with New Crop R

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $503.64

Scenario Cost/Unit: $5.04

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	4	$444.84
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$11.76	5	$58.80

Practice: E328J - Improved crop rotation to provide benefits to pollinators

Scenario: #1 - Improved crop rotation to provide benefits to pollinators

Scenario Description:

Improve the existing crop rotation by adding pollinator friendly crops into the rotation. The crop rotation shall include a minimum of three different crops in a minimum five year crop rotation. Each year, the pollinator friendly crop will be planted on a minimum of 5% of cropland acres contained within the agricultural operation. Use of insecticides is limited for the pollinator friendly crop.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

Feature Measure: Acres planted to pollinator rotation

Scenario Unit: Acres

Scenario Typical Size: 5.0

Scenario Total Cost: $444.84

Scenario Cost/Unit: $88.97

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	4	$444.84

Practice: E328K - Multiple crop types to benefit wildlife

Scenario: #12 - Multiple crop types to benefit wildlife

Scenario Description:

Alternating crops in a systematic arrangement of strips across a field to provide diverse rotations of crops that provide wildlife food. At least two crops will be planted in adjacent strips a minimum of 0.5 acres in size.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard 328 - Conservation Crop Rotation.

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard 328 - Conservation Crop Rotation.

Feature Measure: Acres

Scenario Unit: Acres

Scenario Typical Size: 20.0

Scenario Total Cost: $111.21

Scenario Cost/Unit: $5.56

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	1	$111.21

Practice: E328L - Leaving tall crop residue for wildlife

Scenario: #12 - Leaving tall crop residue for wildlife

Scenario Description:

Fields may be harvested but must leave crop residue standing a minimum of 14 inches. Residue will be left through winter and into spring, providing valuable winter cover and forage for wildlife spanning late summer and through the following winter.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation.

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation.

Feature Measure: acres with small grain stubble/resid

Scenario Unit: Acres

Scenario Typical Size: 40.0

Scenario Total Cost: $444.84

Scenario Cost/Unit: $11.12

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	4	$444.84

Practice: E328M - Diversify crop rotation with canola or sunflower to provide benefits to pollinators

Scenario: #28 - Diversify crop rotation with canola or sunflower to provide benefits to pollinators

Scenario Description:

Diversify the existing crop rotation by adding canola or sunflower into the rotation. Canola or sunflower must be planted on a minimum of 5% of cropland acres. Pesticide use is limited to pre-bloom or bloom and in accordance with IPM and industry best management practices.

Before Situation:

Resources are protected at the minimum level for the Conservation Practice Standard (CPS) 328- Conservation Crop Rotation.

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 328-Conservation Crop Rotation

Feature Measure: Acres planned

Scenario Unit: Acres

Scenario Typical Size: 40.0

Scenario Total Cost: $444.84

Scenario Cost/Unit: $11.12

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	4	$444.84

Practice: E329A - No till to reduce soil erosion

Scenario: #1 - No till to reduce soil erosion

Scenario Description:

Establish no till system to reduce sheet and rill erosion soil loss. Field(s) must have a soil loss at or below the soil tolerance (T) level for water and wind erosion for the crop rotation and a Soil Tillage Intensity Rating (STIR) of no greater than 10 for each crop in the planned rotation. The current NRCS wind and water erosion prediction technologies must be used to calculate soil loss and STIR.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 329 - Residue and Tillage Management - No-Till/ Strip Till/ Direct Seed

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 329 - Residue and Tillage Management - No-Till/ Strip Till/ Direct Seed

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $333.63

Scenario Cost/Unit: $3.34

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	3	$333.63

Practice: E329B - No till to reduce tillage induced particulate matter

Scenario: #1 - No till to reduce tillage induced particulate matter

Scenario Description:

Establish no till system to reduce tillage induced particulate matter. Field(s) must have a soil loss at or below the soil tolerance (T) level for the crop rotation and a Soil Tillage Intensity Rating (STIR) of no greater than 10 for each crop in the planned rotation. The current NRCS wind and water erosion prediction technologies must be used to document soil loss and STIR calculations.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 329 - Residue and Tillage Management - No-Till/ Strip Till/ Direct Seed

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 329 - Residue and Tillage Management - No-Till/ Strip Till/ Direct Seed

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $333.63

Scenario Cost/Unit: $3.34

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	3	$333.63

Practice: E329C - No till to increase plant-available moisture

Scenario: #1 - No till to increase plant-available moisture

Scenario Description:

Establish a no till system to increase plant-available moisture. Each crop in the crop rotation shall have a Soil Tillage Intensity Rating (STIR) of no greater than 20. The current NRCS wind and water erosion prediction technologies must be used to document STIR calculations. Maintain a minimum 60 percent surface residue cover throughout the year to reduce evaporation from the soil surface.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 329 - Residue and Tillage Management - No-Till/ Strip Till/ Direct Seed

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 329 - Residue and Tillage Management - No-Till/ Strip Till/ Direct Seed

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $333.63

Scenario Cost/Unit: $3.34

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	3	$333.63

Practice: E329D - No till system to increase soil health and soil organic matter content

Scenario: #1 - No till system to increase soil health and soil organic matter content

Scenario Description:

Establish a no till system to increase soil health and soil organic matter content. Each crop in the crop rotation shall have a Soil Tillage Intensity Rating (STIR) of no greater than 20. The crop rotation must achieve a soil conditioning index (SCI) of zero or higher. The current NRCS wind and water erosion prediction technologies must be used to document STIR and SCI calculations. Residue shall not be burned, grazed, or harvested.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 329 - Residue and Tillage Management - No-Till/ Strip Till/ Direct Seed

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 329 - Residue and Tillage Management - No-Till/ Strip Till/ Direct Seed

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $444.84

Scenario Cost/Unit: $4.45

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	4	$444.84

Practice: E329E - No till to reduce energy

Scenario: #1 - No till to reduce energy

Scenario Description:

Establish a no till system which reduces total energy consumption associated with field operations by at least 25% compared to current tillage system (benchmark). Each crop in the crop rotation shall have a Soil Tillage Intensity Rating (STIR) of no greater than 20. The current NRCS wind and water erosion prediction technologies must be used to document STIR calculations and energy consumption.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 329 - Residue and Tillage Management - No-Till/ Strip Till/ Direct Seed

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 329 - Residue and Tillage Management - No-Till/ Strip Till/ Direct Seed

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $444.84

Scenario Cost/Unit: $4.45

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	4	$444.84

Practice: E334A - Controlled traffic farming to reduce compaction

Scenario: #1 - Controlled traffic farming to reduce compaction

Scenario Description:

Establish a controlled traffic system where no more than 25% of the surface is tracked with heavy axel loads to minimize soil compaction. For row crops (e.g. corn in 30-inch rows) no tire should run on a row except for flotation tires on combines and/or fertilizer and lime spreading trucks. If wide flotation tires are used, they must be big enough that the inflation pressure will be below 18 psi to minimize compaction on trafficked rows.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 334 - Controlled Traffic Farming

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 334 - Controlled Traffic Farming

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $797.95

Scenario Cost/Unit: $7.98

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	10	$241.90
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	5	$556.05

Practice: E338A - Strategically planned, patch burning for grazing distribution and wildlife habitat

Scenario: #1 - Strategically planned, patch burning for grazing distribution and wildlife habitat

Scenario Description:

Patch burn grazing is the application of prescribed fires on portions of an identified grazing unit at different times of the year. Patch burn grazing allows grazing animals to select where they want to graze creating a mosaic of vegetation structures and diversity that will maintain or enhance the wildlife habitat desired for the identified wildlife species and maintain livestock production.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 338 - Prescribed Burning

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 338 - Prescribed Burning

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $724.13

Scenario Cost/Unit: $7.24

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$109.25	1	$109.25
Equipment Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$96.65	4	$386.60
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	2	$48.38
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	4	$134.56
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	1	$45.34

Practice: E338B - Short-interval burns to promote a healthy herbaceous plant community

Scenario: #1 - Short-interval burns to promote a healthy herbaceous plant community

Scenario Description:

The controlled use of fire is applied in a forest to restore fire-adapted plants while improving wildlife habitat, wildlife food supply, and reducing the risk of damage from intense, severe wildfires. The ideal interval between prescribed burns is not often achieved. To improve the effectiveness of prescribed burning, the frequency of prescribed burning is increased appropriately, for a specified time period, to help restore ecological conditions in forests and woodlands. Short return interval prescribed burning is used to regenerate desirable tree species, improve the condition of fire-adapted plants and native herbaceous vegetation, improve wildlife food supply, create wildlife habitat (snags and den/cavity trees), limit encroachment of competing vegetation including non-native species, and reduce the future risk of damage from intense, severe wildfires.

Before Situation:

The site has a mixture of woody sprouts and some herbaceous vegetation in the forest understory.

After Situation:

The site has a mixture of warm season perennial vegetation and cool-season annual forages. Grazing is occurring to manage the herbaceous vegetation and keep undesirable woody vegetation from occupying the forest understory.

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 40.0

Scenario Total Cost: $3,390.23

Scenario Cost/Unit: $84.76

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.89	8	$407.12
Truck, water	1448	Water tanker truck. Equipment only. Labor not included.	Hours	$136.27	8	$1,090.16
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	24	$580.56
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	8	$269.12
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	8	$362.72
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	4	$444.84
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: E340A - Cover crop to reduce soil erosion

Scenario: #1 - Cover crop to reduce soil erosion

Scenario Description:

Cover crop added to current crop rotation to reduce soil erosion from water and wind to below soil tolerance (T) level. Cover crops grown during critical erosion period(s). Species are selected that will have physical characteristics to provide adequate erosion protection.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 340 - Cover Crop

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 340 - Cover Crop

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $685.72

Scenario Cost/Unit: $6.86

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	1	$34.12
Materials						
Annual Grasses	2730	Annual grasses, one or more species, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$32.58	20	$651.60

Practice: E340B - Intensive cover cropping to increase soil health and soil organic matter content

Scenario: #1 - Intensive cover cropping to increase soil health and soil organic matter content

Scenario Description:

Implementation of cover crop mix to provide soil coverage during ALL non-crop production periods in an annual crop rotation. Cover crop shall not be harvested or burned. Planned crop rotation including cover crops and associated management activities must achieve a soil conditioning index (SCI) of zero or higher. The current NRCS wind and water erosion prediction technologies must be used to document SCI calculations.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 340 - Cover Crop

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 340 - Cover Crop

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $1,181.42

Scenario Cost/Unit: $11.81

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	2	$222.42
Materials						
Annual Grasses, Legumes or Forbs	2732	A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$47.95	20	$959.00

Practice: E340C - Use of multi-species cover crops to improve soil health and increase soil organic matter

Scenario: #1 - Use of multi-species cover crops to improve soil health and increase soil organic matter

Scenario Description:

Implement a multi-species cover crop to add diversity and increase biomass production to improve soil health and increase soil organic matter. Cover crop mix must include a minimum of 4 different species. The cover crop mix will increase diversity of the crop rotation by including crop types currently missing, e.g. Cool Season Grass (CSG), Cool Season Broadleaves (CSB), Warm Season Grasses (WSG), Warm Season Broadleaves (WSB).

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 340 - Cover Crop

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 340 - Cover Crop

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $1,027.24

Scenario Cost/Unit: $10.27

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	2	$68.24
Materials						
Annual Grasses, Legumes or Forbs	2732	A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$47.95	20	$959.00

Practice: E340D - Intensive orchard/vineyard floor cover cropping to increase soil health

Scenario: #1 - Intensive orchard/vineyard floor cover cropping to increase soil health

Scenario Description:

Implement orchard or vineyard floor cover crops. Cover crop shall not be harvested, grazed, or burned. Must achieve a soil conditioning index of zero or higher and produce a positive trend in the Organic Matter subfactor over the life of the rotation.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 340 - Cover Crop

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 340 - Cover Crop

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $1,027.24

Scenario Cost/Unit: $10.27

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	2	$68.24
Materials						
Annual Grasses, Legumes or Forbs	2732	A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$47.95	20	$959.00

Practice: E340E - Use of soil health assessment to assist with development of cover crop mix to improve soil health

Scenario: #1 - Use of soil health assessment to assist with development of cover crop mix to improve soil health

Scenario Description:

Soil health assessment (year 1) to evaluate current crop rotation in addressing soil organic matter depletion. Results are utilized to select a multi-species cover crop mix to add to the current crop rotation. Follow up assessment completed (year 3).

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 340 - Cover Crop

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 340 - Cover Crop

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $309.19

Scenario Cost/Unit: $3.09

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	1	$34.12
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	1	$111.21
Materials						
Annual Grasses, Legumes or Forbs	2732	A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$47.95	1	$47.95
Test, Soil Health, Basic Package	2734	Basic soil health laboratory assessment for soil organic carbon, aggregation, bioavailable nitrogen, respiration, and active carbon according to technical note 450-03. Includes shipping and handling.	Number	$115.91	1	$115.91

Practice: E340F - Cover crop to minimize soil compaction

Scenario: #1 - Cover crop to minimize soil compaction

Scenario Description:

Establish a cover crop mix that includes plants with both fibrous root and deep rooted systems. Fibrous to treat and prevent both near surface (0-4”) and deep (>4”) soil compaction and deep rooted to break up deep compacted soils. Cover crop shall not be harvested, grazed, or burned.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 340 - Cover Crop

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 340 - Cover Crop

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $993.12

Scenario Cost/Unit: $9.93

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	1	$34.12
Materials						
Annual Grasses, Legumes or Forbs	2732	A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$47.95	20	$959.00

Practice: E340G - Cover crop to reduce water quality degradation by utilizing excess soil nutrients

Scenario: #1 - Cover crop to reduce water quality degradation by utilizing excess soil nutrients

Scenario Description:

Establish a cover crop mix to take up excess soil nutrients. Select cover crop species for their ability to effectively utilize nutrients. Terminate the cover crop as late as practical to maximize plant biomass production and nutrient uptake. Cover crop shall not be harvested, grazed, or burned.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 340 - Cover Crop

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 340 - Cover Crop

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $993.12

Scenario Cost/Unit: $9.93

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	1	$34.12
Materials						
Annual Grasses, Legumes or Forbs	2732	A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$47.95	20	$959.00

Practice: E340H - Cover crop to suppress excessive weed pressures and break pest cycles

Scenario: #1 - Cover crop to suppress excessive weed pressures and break pest cycles

Scenario Description:

Establish a cover crop mix to suppress excessive weed pressures and break pest cycles. Select cover crop species for their life cycles, growth habits, and other biological, chemical and/or physical characteristics. Select cover crop species that do not harbor pests or diseases of subsequent crops in the rotation. Cover crop shall not be harvested, grazed, or burned.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 340 - Cover Crop

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 340 - Cover Crop

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $1,027.24

Scenario Cost/Unit: $10.27

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	2	$68.24
Materials						
Annual Grasses, Legumes or Forbs	2732	A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$47.95	20	$959.00

Practice: E340I - Using cover crops for biological strip till

Scenario: #12 - Using cover crops for biological strip till

Scenario Description:

Establish alternating strips of cover crops in which one strip acts as a biological strip-tiller and the adjacent strip promotes soil health with high residue cover crops. This will facilitate planting of the subsequent cash crop into the biologically strip-tilled row without the need for mechanical disturbance.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard 340 - Cover Crop.

After Situation:

The adoption of this enhancement will provide protection above the minimum level as described in Conservation Practice Standard 340 - Cover Crop.

Feature Measure: Acres

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $1,129.60

Scenario Cost/Unit: $11.30

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	5	$170.60
Materials						
Annual Grasses, Legumes or Forbs	2732	A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$47.95	20	$959.00

Practice: E345A - Reduced tillage to reduce soil erosion

Scenario: #1 - Reduced tillage to reduce soil erosion

Scenario Description:

Establish a reduced tillage system to reduce soil loss. Field(s) must have a soil loss at or below the soil tolerance (T) level for water and wind erosion for the crop rotation and a Soil Tillage Intensity Rating (STIR) of no greater than 40 for each crop in the planned rotation. The current NRCS wind and water erosion prediction technologies must be used to calculate soil loss and STIR.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 345 - Residue and Tillage Management, Reduced Till

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 345 - Residue and Tillage Management, Reduced Till

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $444.84

Scenario Cost/Unit: $4.45

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	4	$444.84

Practice: E345B - Reduced tillage to reduce tillage induced particulate matter

Scenario: #1 - Reduced tillage to reduce tillage induced particulate matter

Scenario Description:

Establish a reduced tillage system to reduce tillage induced particulate matter. Field(s) must have a soil loss at or below the soil tolerance (T) level for the crop rotation and a Soil Tillage Intensity Rating (STIR) of no greater than 40 for each crop in the planned rotation. The current NRCS wind and water erosion prediction technologies must be used to document soil loss and STIR calculations.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 345 - Residue and Tillage Management, Reduced Till

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 345 - Residue and Tillage Management, Reduced Till

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $333.63

Scenario Cost/Unit: $3.34

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	3	$333.63

Practice: E345C - Reduced tillage to increase plant-available moisture

Scenario: #1 - Reduced tillage to increase plant-available moisture

Scenario Description:

Establish a reduced till system to increase plant-available moisture. Each crop in the crop rotation shall have a Soil Tillage Intensity Rating (STIR) of no greater than 80. The current NRCS wind and water erosion prediction technologies must be used to document STIR calculations. Maintain a minimum 60 percent surface residue cover throughout the year to reduce evaporation from the soil surface.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 345 - Residue and Tillage Management, Reduced Till

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 345 - Residue and Tillage Management, Reduced Till

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $333.63

Scenario Cost/Unit: $3.34

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	3	$333.63

Practice: E345D - Reduced tillage to increase soil health and soil organic matter content

Scenario: #1 - Reduced tillage to increase soil health and soil organic matter content

Scenario Description:

Establish a reduced till system to increase soil health and soil organic matter content. Each crop in the crop rotation shall have a Soil Tillage Intensity Rating (STIR) of no greater than 80. The crop rotation must achieve a soil conditioning index (SCI) of zero or higher and produce a positive trend in the Organic Matter (OM) subfactor over the life of the crop rotation. The current NRCS wind and water erosion prediction technologies must be used to document STIR and SCI calculations. Residue shall not be burned, grazed, or harvested.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 345 - Residue and Tillage Management, Reduced Till

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 345 - Residue and Tillage Management, Reduced Till

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $444.84

Scenario Cost/Unit: $4.45

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	4	$444.84

Practice: E345E - Reduced tillage to reduce energy use

Scenario: #1 - Reduced tillage to reduce energy use

Scenario Description:

Establish a reduced tillage system which reduces total energy consumption associated with field operations by at least 25% compared to conventional tillage systems (benchmark). Each crop in the crop rotation shall have a Soil Tillage Intensity Rating (STIR) of no greater than 80. The current NRCS wind and water erosion prediction technologies must be used to document STIR calculations and energy consumption.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 345 - Residue and Tillage Management, Reduced Till

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 345 - Residue and Tillage Management, Reduced Till

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $333.63

Scenario Cost/Unit: $3.34

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	3	$333.63

Practice: E373A - Dust suppressant re-application for stabilization

Scenario: #28 - Dust Suppressant Re-application, Once per Year

Scenario Description:

Limit dust emissions by maintaining the surfaces of unpaved roads and areas in a stabilized condition. The periodic re-application of dust suppressants to unpaved surface areas will limit dust generation from vehicle and machinery activities or wind action.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 373 - Dust Control on Unpaved Roads and Surfaces.

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 373 - Dust Control on Unpaved Roads and Surfaces.

Feature Measure: Square Feet

Scenario Unit: Square Feet

Scenario Typical Size: 15,840.0

Scenario Total Cost: $3,369.24

Scenario Cost/Unit: $0.21

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	0.36	$1.92
Motor Grader, 200 HP	1782	Motor Grader or Maintainer, 200 hp. Typical of equipment with HP in range of 170-225. Equipment cost, does not include labor.	Hours	$170.80	3	$512.40
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	3	$100.92
Materials						
Chemical, dust control, road oil, petroleum-based	1339	Petroleum-based road oil, such as SC-250 or SC-800. Includes materials and shipping only.	Gallons	$3.06	900	$2,754.00

Practice: E374A - Install variable frequency drive(s) on pump(s)

Scenario: #1 - Install variable frequency drive(s) on pump(s)

Scenario Description:
Install Variable Frequency Drive(s) (VFD) on Pumping Plant (Conservation Practice Standard CPS 533) with the correct sensors, on all pumps indicated in the energy audit.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 374 - Farmstead Energy Improvement

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 374 - Farmstead Energy Improvement

Feature Measure: Each

Scenario Unit: Brake Horse Power

Scenario Typical Size: 50.0

Scenario Total Cost: $5,197.50

Scenario Cost/Unit: $103.95

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Materials						
Variable Speed Drive, 50 HP	1288	Variable speed drive for 50 Horsepower electric motor. Does not include motor. Materials only.	Horsepower	$103.95	50	$5,197.50

Practice: E374B - Switch fuel source for pump motor(s)

Scenario: #1 - Switch fuel source for pump motor(s)

Scenario Description:
Switch the fuel source for the pump motor(s) indicated in the energy audit to a renewable source (wind, solar, geothermal, etc.). (CPS 533 Pumping Plant)

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 374 - Farmstead Energy Improvement

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 374 - Farmstead Energy Improvement

Feature Measure: Horsepower

Scenario Unit: Horsepower

Scenario Typical Size: 5.0

Scenario Total Cost: $14,528.13

Scenario Cost/Unit: $2,905.63

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	1	$22.29
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	12	$409.44
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	2	$222.42
Materials						
Pump, <= 5 HP, pump and motor, fixed cost portion	1009	Fixed cost portion of a pump less than or equal to 5 HP pump and motor. This portion is a base cost and is not dependant on horsepower. The total cost of any pump will include this fixed cost plus a variable cost portion. The completed pump and motor will include the motor and controls. Includes material and shipping only.	Each	$1,019.47	1	$1,019.47
Pump, <= 5 HP, pump and motor, variable cost portion	1010	Variable cost portion of a pump less than or equal to 5 HP pump and motor. This portion IS dependent on the total horsepower for the pump. The total cost of any pump will include this variable cost plus the fixed cost portion. The completed pump and motor will include the motor and controls. Includes material and shipping only.	Horsepower	$353.92	5	$1,769.60
Solar Panels, fixed cost portion	1031	Fixed cost portion of the Solar Panels. This portion is a base cost for all Solar Panels and is not dependant on KiloWatt. The total cost of any Solar Panels will include this fixed cost plus a variable cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drops and etc). This cost will include material, labor and equipment.	Each	$273.31	5	$1,366.55
Solar Panels, variable cost portion	1135	Variable cost portion of the Solar Panels. This portion IS dependent on the total Kilowatt for the Solar Panels. The total cost of any Solar Panels will include this variable cost plus the fixed cost portion. The completed Solar Panels will include all materials (electrical, controllers, and service drop, etc). This cost will include material, labor and equipment.	Kilowatt	$2,429.59	4	$9,718.36

Practice: E376A - Modify field operations to reduce particulate matter

Scenario: #1 - Modify field operations to reduce particulate matter

Scenario Description:
Modify tillage and/or harvest operations to reduce particulates by at least 20 percent below the required levels.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 376 - Field Operations Emissions Reduction

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 376 - Field Operations Emissions Reduction

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $333.63

Scenario Cost/Unit: $3.34

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	3	$333.63

Practice: E383A - Grazing-maintained fuel break to reduce the risk of fire

Scenario: #1 - Grazing-maintained fuel break to reduce the risk of fire

Scenario Description:

The area has existing fuel break(s) of 30 to 60 feet in width, supporting a mixture of woody sprouts and some herbaceous vegetation. Warm-season perennial vegetation will be established on the fuel breaks, and will be over-seeded with cool-season annual forages in the fall. Grazing will be managed on the fuel breaks to remove or modify the fine fuel vegetation, thus reducing the risk of fire spread from ground fires. Ground cover will be maintained to control soil erosion and facilitate prescribed burning.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 383 - Fuel Break

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 383 - Fuel Break

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 10.0

Scenario Total Cost: $2,270.39

Scenario Cost/Unit: $227.04

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.12	10	$61.20
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	10	$203.10
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	24	$580.56
Materials						
Nitrogen (N), Urea	71	Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.48	1000	$480.00
Annual Grasses, Legumes or Forbs	2732	A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$47.95	10	$479.50
Introduced Perennial Grasses, Legumes and/or Forbs, Low Density	2747	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$30.75	10	$307.50
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53

Practice: E384A - Biochar production from woody residue

Scenario: #1 - Biochar production from woody residue

Scenario Description:
Utilizes woody debris remaining after fuel reduction harvests or wildfires to create biochar. Biochar stores carbon and is a useful soil amendment that improves SOM and water-holding capacity.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 384 - Woody Residue Treatment

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 384 - Woody Residue Treatment

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 2.0

Scenario Total Cost: $12,309.19

Scenario Cost/Unit: $6,154.60

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Hydraulic Excavator, .5 CY	930	Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included.	Hours	$57.32	40	$2,292.80
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.59	40	$263.60
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	15	$334.35
Water tank, portable	1602	Portable water tank transported in a pick up truck. Typically with 200 gallon capacity includes tank with pump, hose and sprayer. Does not include the pickup truck. Equipment only.	Hours	$12.92	80	$1,033.60
Wood Processor	2680	Towable equipment used to cut and split wood, Daily rental rate. All materials and equipment included	Day	$240.00	5	$1,200.00
Biochar Kiln, open fire	2681	Open fire kiln or metal container used to produce biochar/charcoal production. Daily rental rate. Includes all material and equipment	Hours	$6.85	320	$2,192.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	120	$2,902.80
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	40	$1,058.40
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	5	$556.05
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	3	$475.59

Practice: E386A - Enhanced field borders to reduce soil erosion along the edge(s) of a field

Scenario: #1 - Enhanced field borders to reduce soil erosion along the edge(s) of a field

Scenario Description:
Enhance existing field borders to a width of at least 30 feet and establish a single species or mixture of species that provide a dense ground cover along the edge(s) of the field.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 386 - Field Border

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 386 - Field Border

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 1.0

Scenario Total Cost: $528.65

Scenario Cost/Unit: $528.65

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	1	$9.89
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	1	$5.34
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	1	$20.31
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acres	$8.00	1	$8.00
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$215.46	0.41	$88.34
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$248.06	0.36	$89.30
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acres	$121.05	0.23	$27.84
Materials						
Introduced Perennial Grasses, Legumes and/or Forbs, Medium Density	2748	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to higher density (41-60 pure live seeds/sq ft). Includes material and shipping.	Acres	$43.92	1	$43.92
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: E386B - Enhanced field borders to increase carbon storage along the edge(s) of the field

Scenario: #1 - Enhanced field borders to increase carbon storage along the edge(s) of the field

Scenario Description:
Enhance existing field borders to a width of at least 30 feet and establish a single species or mixture of species that provide a dense ground cover and dense rooting system along the edge(s) of the field.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 386 - Field Border

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 386 - Field Border

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 1.0

Scenario Total Cost: $608.18

Scenario Cost/Unit: $608.18

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	1	$9.89
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	1	$5.34
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	1	$20.31
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acres	$8.00	1	$8.00
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$215.46	0.41	$88.34
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$248.06	0.36	$89.30
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acres	$121.05	0.23	$27.84
Materials						
Native and Introduced Perennial Grasses, Legumes and/or Forbs, Medium Density	2756	A mix of native and introduced perennial grasses, legumes, and/or forbs, grasses typically greater than 50% of the mix, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to high density (41-60 pure live seeds/sq ft). Includes material and shipping.	Acres	$123.45	1	$123.45
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: E386C - Enhanced field borders to decrease particulate emissions along the edge(s) of the field

Scenario: #1 - Enhanced field borders to decrease particulate emissions along the edge(s) of the field

Scenario Description:
Enhance existing field borders to a width of at least 40 feet and establish a mixture of species that decrease the particulate emissions along the edge(s) of the field.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 386 - Field Border

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 386 - Field Border

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 1.0

Scenario Total Cost: $541.83

Scenario Cost/Unit: $541.83

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	1	$9.89
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	1	$5.34
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	1	$20.31
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acres	$8.00	1	$8.00
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$215.46	0.41	$88.34
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$248.06	0.36	$89.30
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acres	$121.05	0.23	$27.84
Materials						
Introduced Perennial Grasses, Legumes and/or Forbs, High Density	2749	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Includes material and shipping.	Acres	$57.10	1	$57.10
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: E386D - Enhanced field borders to increase food for pollinators along the edge(s) of a field

Scenario: #1 - Enhanced field borders to increase food for pollinators along the edge(s) of a field

Scenario Description:
Enhance existing field borders to a width of at least 40 feet and establish a mixture of species that provide food for pollinators along the edge(s) of the field.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 386 - Field Border

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 386 - Field Border

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 1.0

Scenario Total Cost: $608.18

Scenario Cost/Unit: $608.18

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	1	$9.89
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	1	$5.34
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	1	$20.31
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acres	$8.00	1	$8.00
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$215.46	0.41	$88.34
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$248.06	0.36	$89.30
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acres	$121.05	0.23	$27.84
Materials						
Native and Introduced Perennial Grasses, Legumes and/or Forbs, Medium Density	2756	A mix of native and introduced perennial grasses, legumes, and/or forbs, grasses typically greater than 50% of the mix, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to high density (41-60 pure live seeds/sq ft). Includes material and shipping.	Acres	$123.45	1	$123.45
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: E386E - Enhanced field borders to increase wildlife food and habitat along the edge(s) of a field

Scenario: #1 - Enhanced field borders to increase wildlife food and habitat along the edge(s) of a field

Scenario Description:

Enhance existing field borders to a width of at least 40 feet and establish a mixture of species that provide wildlife food and habitat along the edge(s) of the field. The extended field border will also provide enhanced wildlife habitat continuity.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 386 - Field Border

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 386 - Field Border

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 1.0

Scenario Total Cost: $608.18

Scenario Cost/Unit: $608.18

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	1	$9.89
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	1	$5.34
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	1	$20.31
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acres	$8.00	1	$8.00
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$215.46	0.41	$88.34
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$248.06	0.36	$89.30
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acres	$121.05	0.23	$27.84
Materials						
Native and Introduced Perennial Grasses, Legumes and/or Forbs, Medium Density	2756	A mix of native and introduced perennial grasses, legumes, and/or forbs, grasses typically greater than 50% of the mix, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to high density (41-60 pure live seeds/sq ft). Includes material and shipping.	Acres	$123.45	1	$123.45
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: E390A - Increase riparian herbaceous cover width for sediment and nutrient reduction

Scenario: #1 - Increase riparian herbaceous cover width for sediment and nutrient reduction

Scenario Description:

Where an existing herbaceous riparian buffer is located along a river, stream, pond, lake, or other waterbody, increase the width of the buffer in order to allow a greater percentage of sediment and nutrient removal from surface and subsurface flows.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 390 - Riparian Herbaceous Cover

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 390 - Riparian Herbaceous Cover

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 2.0

Scenario Total Cost: $864.50

Scenario Cost/Unit: $432.25

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	2	$10.68
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	2	$40.62
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$215.46	0.82	$176.68
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$248.06	0.72	$178.60
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acres	$121.05	0.46	$55.68
Materials						
Herbicide, Imazapyr	336	Pre and post-emergent, non-selective herbicide for control of undesirable vegetation in non-crop areas. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$42.07	2	$84.14
Native Perennial Grasses, Medium Density	2751	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to higher density (41-60 pure live seeds/sq ft). Includes material and shipping.	Acres	$159.05	2	$318.10

Practice: E390B - Increase riparian herbaceous cover width to enhance wildlife habitat

Scenario: #1 - Increase riparian herbaceous cover width to enhance wildlife habitat

Scenario Description:

Where an existing herbaceous riparian buffer is located along a river, stream, pond, lake, or other waterbody, increase the diversity of native species, control invasive species, install fencing and relocate equipment operations, trails, and livestock, and increase the width of the buffer.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 390 - Riparian Herbaceous Cover

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 390 - Riparian Herbaceous Cover

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 4.0

Scenario Total Cost: $1,266.46

Scenario Cost/Unit: $316.62

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	4	$21.36
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	2	$40.62
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$215.46	1	$215.46
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$248.06	1	$248.06
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acres	$121.05	0.46	$55.68
Materials						
Herbicide, Imazapyr	336	Pre and post-emergent, non-selective herbicide for control of undesirable vegetation in non-crop areas. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$42.07	4	$168.28
Native Perennial Grasses, Legumes and/or Forbs, Medium Density	2754	A mix of native perennial grasses, legumes, and/or forbs, grasses typically greater than 50% of the mix, mmay include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to higher density (41-60 pure live seeds/sq ft). Species typically easy to purchase. Includes material and shipping.	Acres	$258.50	2	$517.00

Practice: E391A - Increase riparian forest buffer width for sediment and nutrient reduction

Scenario: #1 - Increase riparian forest buffer width for sediment and nutrient reduction

Scenario Description:
Where an existing forested riparian area is located along a river, stream, pond, lake, or other waterbody, increase the width of the buffer in order to allow a greater percentage of sediment and nutrient removal from surface and subsurface flows.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 391 - Riparian Forest Buffer

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 391 - Riparian Forest Buffer

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 2.0

Scenario Total Cost: $3,907.89

Scenario Cost/Unit: $1,953.95

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	16	$356.64
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hours	$46.50	2	$93.00
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	2	$10.68
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$21.30	4	$85.20
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$11.47	16	$183.52
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$215.46	0.82	$176.68
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$248.06	0.72	$178.60
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acres	$121.05	0.46	$55.68
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	16	$387.04
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	4	$105.84
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	4	$181.36
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$9.21	1	$9.21
Herbicide, Sulfometuron & metsulfuron	344	A residual sulfonylurea herbicide that kills broadleaf weeds and some annual grasses. It is a systemic compound with foliar and soil activity. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$10.96	1	$10.96
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$1.51	1	$1.51
Tree, Hardwood, Seedling, Medium	1510	Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only.	Each	$1.52	872	$1,325.44

Tree shelter, solid tube type, 4 in. x 48 in.	1566	4 inch x 48 inch tree tube for protection from animal damage. Materials only.	Each	$4.22	100	$422.00
Stakes, wood, 1 in. x 1 in. x 48 in.	1578	1 in. x 1 in. x 48 in. wood stakes to fasten items in place. Includes materials only.	Each	$1.66	100	$166.00
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53

Practice: E391B - Increase stream shading for stream temperature reduction

Scenario: #1 - Increase stream shading for stream temperature reduction

Scenario Description:
Riparian area tree canopy cover density is increased and the extent of the forested riparian area is increased to provide greater stream shading.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 391 - Riparian Forest Buffer

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 391 - Riparian Forest Buffer

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 2.0

Scenario Total Cost: $3,956.27

Scenario Cost/Unit: $1,978.14

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	16	$356.64
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hours	$46.50	2	$93.00
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	2	$10.68
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$21.30	4	$85.20
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$11.47	16	$183.52
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$215.46	0.82	$176.68
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$248.06	0.72	$178.60
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acres	$121.05	0.46	$55.68
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	18	$435.42
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	4	$105.84
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	4	$181.36
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$9.21	1	$9.21
Herbicide, Sulfometuron & metsulfuron	344	A residual sulfonylurea herbicide that kills broadleaf weeds and some annual grasses. It is a systemic compound with foliar and soil activity. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$10.96	1	$10.96
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$1.51	1	$1.51
Tree, Hardwood, Seedling, Medium	1510	Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only.	Each	$1.52	872	$1,325.44
Tree shelter, solid tube type, 4 in. x 48 in.	1566	4 inch x 48 inch tree tube for protection from animal damage. Materials only.	Each	$4.22	100	$422.00

Stakes, wood, 1 in. x 1 in. x 48 in.	1578	1 in. x 1 in. x 48 in. wood stakes to fasten items in place. Includes materials only.	Each	$1.66	100	$166.00
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53

Practice: E391C - Increase riparian forest buffer width to enhance wildlife habitat

Scenario: #1 - Increase riparian forest buffer width to enhance wildlife habitat

Scenario Description:

Where an existing riparian forest buffer is located along a river, stream, pond, lake, or other waterbody, increase the diversity of native species, control invasive species, install fencing and relocate equipment operations, trails, and livestock to increase the functional width of the buffer.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 391 - Riparian Forest Buffer

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 391 - Riparian Forest Buffer

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 2.0

Scenario Total Cost: $3,956.27

Scenario Cost/Unit: $1,978.14

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	16	$356.64
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hours	$46.50	2	$93.00
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	2	$10.68
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$21.30	4	$85.20
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$11.47	16	$183.52
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$215.46	0.82	$176.68
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$248.06	0.72	$178.60
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acres	$121.05	0.46	$55.68
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	18	$435.42
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	4	$105.84
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	4	$181.36
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$9.21	1	$9.21
Herbicide, Sulfometuron & metsulfuron	344	A residual sulfonylurea herbicide that kills broadleaf weeds and some annual grasses. It is a systemic compound with foliar and soil activity. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$10.96	1	$10.96
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$1.51	1	$1.51
Tree, Hardwood, Seedling, Medium	1510	Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only.	Each	$1.52	872	$1,325.44

Tree shelter, solid tube type, 4 in. x 48 in.	1566	4 inch x 48 inch tree tube for protection from animal damage. Materials only.	Each	$4.22	100	$422.00
Stakes, wood, 1 in. x 1 in. x 48 in.	1578	1 in. x 1 in. x 48 in. wood stakes to fasten items in place. Includes materials only.	Each	$1.66	100	$166.00
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53

Practice: E393A - Extend existing filter strip to reduce water quality impacts

Scenario: #1 - Extend existing filter strip to reduce water quality impacts

Scenario Description:

Extend existing filter strips for water quality protection. Extend the existing buffer for a total of 60 feet or more to enhance water quality functions. The extended buffers must be composed of at least 5 species of non-noxious, wildlife friendly grasses and/or perennial forbs best suited to site conditions. Include species that provide pollinator food and habitat where possible.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 393 - Filter Strip

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 393 - Filter Strip

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 1.0

Scenario Total Cost: $830.60

Scenario Cost/Unit: $830.60

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$9.89	1	$9.89
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	1	$5.34
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	1	$20.31
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acres	$8.00	1	$8.00
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$215.46	0.41	$88.34
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$248.06	0.36	$89.30
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acres	$121.05	0.23	$27.84
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	2	$222.42
Materials						
Native and Introduced Perennial Grasses, Legumes and/or Forbs, Medium Density	2756	A mix of native and introduced perennial grasses, legumes, and/or forbs, grasses typically greater than 50% of the mix, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to high density (41-60 pure live seeds/sq ft). Includes material and shipping.	Acres	$123.45	1	$123.45
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: E395A - Stream habitat improvement through placement of woody biomass

Scenario: #1 - Stream habitat improvement through placement of woody biomass

Scenario Description:
Flexible placement of wood (unanchored/unpinned) in small, 1st and 2nd order streams to improve stream habitat conditions for aquatic species and natural stream processes.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 395 - Stream Habitat Improvement and Management

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 395 - Stream Habitat Improvement and Management

Feature Measure: Bankfull width X Length

Scenario Unit: Acres

Scenario Typical Size: 1.0

Scenario Total Cost: $18,390.24

Scenario Cost/Unit: $18,390.24

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hours	$120.60	16	$1,929.60
Truck, dump, 12 CY	1215	Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only.	Hours	$72.63	8	$581.04
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	24	$807.36
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic Yards	$28.74	20	$574.80
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic Yards	$30.07	30	$902.10
Compost	265	A mixture of decaying organic matter, as from leaves and manure, used to improve soil structure and provide nutrients.	Ton	$43.63	1	$43.63
Tree & Shrub, Woody, Cuttings, Large	1309	Woody pole cuttings or posts 2 to 6 inches in diameter and 6 ft. long. Includes materials and shipping only.	Each	$14.97	300	$4,491.00
Boulder	1761	Rock boulders (approximately 5 ft dia. 6.67 Tons) Inlcudes materials and delivery (up to 100 miles) only.	Ton	$66.53	40	$2,661.20
Steel, rebar	1832	Steel rebar, grade 60. Materials only.	Pound	$0.72	50	$36.00
Aggregate, river rock	1834	Well graded, rounded mineral substrates derived from local riverine settings. Includes materials and local delivery	Ton	$24.49	15	$367.35
Log, un-anchored	2035	Price of log picked up at the Mill. Includes material only.	Ton	$163.19	30	$4,895.70
Root Wad	2045	Tree stump buried into the streambank with the roots left exposed. Includes material only.	Ton	$10.02	20	$200.40
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$450.03	2	$900.06

Practice: E399A - Fishpond management for native aquatic and terrestrial species

Scenario: #1 - Fishpond management for native aquatic and terrestrial species

Scenario Description:
Pond rehabilitation, buffer, and watershed management actions are taken to improve habitat for native species of fish, amphibians, and shorebirds.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 399 - Fishpond Management

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 399 - Fishpond Management

Feature Measure: Pond area + buffer area

Scenario Unit: Acres

Scenario Typical Size: 2.0

Scenario Total Cost: $2,527.70

Scenario Cost/Unit: $1,263.85

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	4	$89.16
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	1	$5.34
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	1	$20.31
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	3	$102.36
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	32	$774.08
Materials						
Herbicide, Imazapyr	336	Pre and post-emergent, non-selective herbicide for control of undesirable vegetation in non-crop areas. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$42.07	1	$42.07
Herbicide, Diquat dibromide	1820	Aquatic herbicide and plant growth regulator. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Gallons	$77.35	1	$77.35
Native Aquatic Plants, Emergent or Submerged	2336	Native aquatic emergent or submerged. All required materials for establishing vegetation. Includes material and shipping.	Each	$1.00	1000	$1,000.00
Native Perennial Grasses, Legumes and/or Forbs, Medium Density	2754	A mix of native perennial grasses, legumes, and/or forbs, grasses typically greater than 50% of the mix, mmay include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to higher density (41-60 pure live seeds/sq ft). Species typically easy to purchase. Includes material and shipping.	Acres	$258.50	1	$258.50
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53

Practice: E412A - Enhance a grassed waterway

Scenario: #12 - Waterway, reshape/extend/widen

Scenario Description:

Typical practice is 1500 ' long, 12' bottom, 8:1 side slopes, 1.1' depth. A grass waterway that is a shaped or graded channel and is established with suitable vegetation to carry surface water at a non-erosive velocity to a stable outlet. This practice addresses Concentrated Flow Erosion (Classic Gully & Ephemeral Erosion) and Excessive Sediment in surface waters. Waterway area measured from top of bank to top of bank. Seeding will be completed under the Critical Area Planting (342) Practice Standard with seeding area up to 20% greater than waterway area to account for buffer area along the waterway. Costs include excavation and associated work to construct the overall shape and grade of the waterway. This scenario would apply to Grassed Waterways without erosion control blanket or rock checks.

Before Situation:

The field has a grassed waterway, but a gully cutting upstream, downstream, or adjacent to the existing grassed waterway has formed as time goes on, so the new gully needs to be stopped or controlled. The new gully has formed in field as a result of a change in runoff amounts from the original design from subsurface drainage outlets, change in cropping techniques, change in land use, etc.

After Situation:

An installed grassed waterway has been installed that is possibly wider or longer than the original grassed waterway that wasn't functioning properly anymore. The new installed grassed waterway is 1500 ' long, 12' bottom, 8:1 side slopes, 1.1' depth. The practice is installed using a dozer and/or scraper, with final grading with motor grader. Use Critical Area Planting (342) for establishment of waterway vegetation. If erosion control blankets or mulching for seedbed establishment/protection are needed, use conservation practice Mulching (484). Drainage tile, if needed, will be installed accoring to Subsurface Drain (606).

Feature Measure: Acres of Waterway reshaped, exten

Scenario Unit: Acres

Scenario Typical Size: 1.0

Scenario Total Cost: $3,972.23

Scenario Cost/Unit: $3,972.23

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Stripping and stockpiling, topsoil	1199	Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor.	Cubic Yards	$0.87	411	$357.57
Excavation, common earth, large equipment, 150 ft	1223	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yards	$3.64	954	$3,472.56
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	4	$96.76
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	1	$45.34

Practice: E420A - Establish pollinator habitat

Scenario: #12 - Establish Pollinator Habitat

Scenario Description:

Seed or plug nectar and pollen producing plants in non-cropped areas such as field borders, vegetative barriers, contour buffer strips, shelterbelts, hedgerows, windbreaks, conservation cover, and riparian forest and herbaceous buffers.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 420 - Wildlife Habitat Planting

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 420 - Wildlife Habitat Planting

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 1.0

Scenario Total Cost: $507.16

Scenario Cost/Unit: $507.16

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	2	$48.38
Materials						
Native Perennial Grasses, Legumes and/or Forb Mix for Targeted Wildlife/Pollinator Habitat or Ecological Restoration, moderate commercial availability	2619	Diverse mix of native perennial grasses, legumes and forbs, less than 50% grasses, may include biennials and a small percentage of annual species for establishment purposes and/or if allowed by the CPS. This is a mix composed of species required to meet specific wildlife/pollinator habitat or ecological requirements. Seed is moderately easy to purchase commercially. Includes materials and shipping.	Acres	$458.78	1	$458.78

Practice: E420B - Establish monarch butterfly habitat

Scenario: #12 - Establish Monarch Habitat

Scenario Description:
Seed or plug milkweed (Asclepias spp.) and high-value monarch butterfly nectar plants on marginal cropland, field borders, contour buffer strips and similar areas.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 420 - Wildlife Habitat Planting.

After Situation:
Adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 420 - Wildlife Habitat Planting.

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 1.0

Scenario Total Cost: $847.33

Scenario Cost/Unit: $847.33

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hours	$46.50	1	$46.50
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hours	$66.08	2	$132.16
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acres	$8.00	1	$8.00
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	2	$90.68
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	1	$111.21
Materials						
Native Perennial Grasses, Legumes and/or Forb Mix for Targeted Wildlife/Pollinator Habitat or Ecological Restoration, moderate commercial availability	2619	Diverse mix of native perennial grasses, legumes and forbs, less than 50% grasses, may include biennials and a small percentage of annual species for establishment purposes and/or if allowed by the CPS. This is a mix composed of species required to meet specific wildlife/pollinator habitat or ecological requirements. Seed is moderately easy to purchase commercially. Includes materials and shipping.	Acres	$458.78	1	$458.78

Practice: E449A - Complete pumping plant evaluation for water savings

Scenario: #1 - Complete pumping plant evaluation for water savings

Scenario Description:

Evaluation of all pumping plants to determine the potential to rehabilitate/replace/reconfigure pump performance to improve water delivery efficiency 10% or more. Evaluate to determine if a Variable Frequency Drive motor controller(s) is recommended and the simple payback in terms of energy savings is less than 10 years.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 449 – Irrigation Water Management

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in the Conservation Practice Standard, (CPS) 449 – Irrigation Water Management.

Feature Measure: Acres

Scenario Unit: Acres

Scenario Typical Size: 640.0

Scenario Total Cost: $3,896.77

Scenario Cost/Unit: $6.09

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	8	$272.96
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	32	$3,558.72
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	1	$65.09

Practice: E449I - Sprinkler Irrigation Equipment Retrofit

Scenario: #28 - IWM - Year 1, Retrofit Equipment with Speed Control on Sprinkler Irrigation

Scenario Description:

This activity involves installing speed control equipment to a sprinkler irrigated field for irrigation water management. The installation of the equipment is in year one. It is applicable to sprinkler irrigation systems that do not already have the functionality and are able to integrate the speed control technology.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 449 - Irrigation Water Management

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 449 - Irrigation Water Management.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $1,397.03

Scenario Cost/Unit: $1,397.03

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	8	$272.96
Materials						
Center Pivot VRI, Speed Control	2727	Center pivot irrigation system using variable rate irrigation using speed control technology. Includes controller, sensors, GPS unit, and installation.	Number	$1,124.07	1	$1,124.07

Practice: E484A - Mulching to improve soil health

Scenario: #1 - Mulching to improve soil health

Scenario Description:

Implement a crop rotation which utilizes mulch and addresses all four principle components of soil health: increases diversity of the cropping system; maintains residue throughout the year; keeps a living root; and minimizes soil chemical, physical and biological disturbance. Plant-based mulching materials will be applied at least once during the rotation. The rotation will include at least 4 different crops and/or cover crops grown in a sequence that will produce a positive trend in the Organic Matter (OM) subfactor value over the life of the rotation, as determined by the Soil Conditioning Index (SCI). The current NRCS wind and water erosion prediction technologies must be used to document the rotation and SCI calculations.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 484 - Mulching

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 484 - Mulching

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $222.42

Scenario Cost/Unit: $2.22

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	2	$222.42

Practice: E484B - Reduce particulate matter emissions by using orchard or vineyard generated woody materials as mulch

Scenario: #1 - Reduce particulate matter emissions by using orchard or vineyard generated woody materials as mulch

Scenario Description:

Reduce particulate matter emissions by using orchard or vineyard generated woody materials as mulch. At least 90% of all woody materials are to be used as mulch on the operation. An exception may be made when it is determined that infected material must be burned to preserve crop health.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 484 – Mulching

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 484 - Mulching

Feature Measure: Actual Acres of Crop producing Wo

Scenario Unit: Acres

Scenario Typical Size: 40.0

Scenario Total Cost: $638.36

Scenario Cost/Unit: $15.96

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	8	$193.52
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	4	$444.84

Practice: E484C - Mulching with natural materials in specialty crops for weed control

Scenario: #12 - Mulching with natural materials in specialty crops for weed control

Scenario Description:
Application of straw mulch or other state approved natural material (such as wood chips, compost, green chop, dry hay or sawdust) for weed control in specialty crops.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard 484 - Mulching

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard 484 - Mulching

Feature Measure: Acres

Scenario Unit: Acres

Scenario Typical Size: 10.0

Scenario Total Cost: $387.11

Scenario Cost/Unit: $38.71

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$21.30	2	$42.60
Mulcher, straw blower	1305	Straw bale mulcher/blower to mechanically spread small or large straw bales. Labor not included.	Hours	$41.44	2	$82.88
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	2	$52.92
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	1	$111.21
Materials						
Straw	1237	Small grain straw (non organic and certified organic). Includes materials only.	Ton	$65.00	1.5	$97.50

Practice: E511A - Harvest of crops (hay or small grains) using measures that allow desired species to flush or escape

Scenario: #1 - Harvest of crops (hay or small grains) using measures that allow desired species to flush or escape

Scenario Description:

Harvest of crops (hay or small grains) using conservation measures that allow desired species to flush or escape. (For species list see State Wildlife Action Plan) Conservation measures include timing of harvest, idling land during the nesting or fawning period, and applying harvest techniques that reduce mortality to wildlife.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 511 - Forage Harvest Management

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 511 - Forage Harvest Management

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 50.0

Scenario Total Cost: $167.54

Scenario Cost/Unit: $3.35

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Foregone Income						
FI, Hay, General Grass	2122	General Grass Hay is Primary Land Use	Ton	$30.49	1.67	$50.92
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	2	$68.24
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	2	$48.38

Practice: E511B - Forage harvest management that helps maintain wildlife habitat cover, shelter or continuity

Scenario: #1 - Forage harvest management that helps maintain wildlife habitat cover, shelter or continuity

Scenario Description:

The timely cutting and removal of forages from the field as hay, green-chop, or ensilage in such a way, and in time frames, to optimize both forage yield/quality and wildlife cover and shelter and/or continuity between otherwise disconnected habitats.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 511 - Forage Harvest Management

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 511 - Forage Harvest Management

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $506.84

Scenario Cost/Unit: $5.07

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$18.46	25	$461.50
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	1	$45.34

Practice: E511C - Forage testing for improved harvesting methods and hay quality

Scenario: #12 - Hay quality record keepoing for livestock producers

Scenario Description:

This enhancement results in participants obtaining hay samples and submitting them to a land grant university or other accredited lab for quality analysis. The participant will record data for multiple harvests and use the data to make future decisions. The participant will discuss the results with NRCS or with their cooperative extensions service. Technical recommendations are made to the participant based upon the test results.

Before Situation:

The participant has hay that doesn't have quality analysis or doesn't know the quality of previous hay harvests. The hay will be fed when needed.

After Situation:

The participant has hay with hay quality analysis. The participant records data based upon the results to reference and make future decisions. The participant has a better understanding on the quality of hay so that adjustments in feeding or supplementation can be made.

Feature Measure: Each

Scenario Unit: Number

Scenario Typical Size: 2.0

Scenario Total Cost: $260.13

Scenario Cost/Unit: $130.07

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	2	$48.38
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	1	$45.34
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	1	$111.21
Materials						
Test, Feed Analysis	1989	Representative sample of feed. Includes materials and shipping only.	Each	$27.60	2	$55.20

Practice: E512A - Cropland conversion to grass-based agriculture to reduce soil erosion

Scenario: #1 - Cropland conversion to grass-based agriculture to reduce soil erosion

Scenario Description:

Conversion of cropped land to grass-based agriculture to reduce soil erosion. Mixtures of perennial grasses, forbs, and legume species are established on cropland where annually-seeded cash crops have been grown.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 512 - Forage and Biomass Planting

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 512 - Forage and Biomass Planting

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $705.68

Scenario Cost/Unit: $7.06

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	2	$90.68
Materials						
Introduced Perennial Grasses, Legumes and/or Forbs, Low Density	2747	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$30.75	20	$615.00

Practice: E512B - Forage and biomass planting to reduce soil erosion or increase organic matter to build soil health

Scenario: #1 - Forage and biomass planting to reduce soil erosion or increase organic matter to build soil health

Scenario Description:

Establishing adapted and/or compatible species, varieties, or cultivars of herbaceous species suitable for pasture, hay, or biomass production that can provide for reduced soil erosion, improving soil health.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 512 - Forage and Biomass Planting

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 512 - Forage and Biomass Planting

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $2,317.28

Scenario Cost/Unit: $23.17

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	2	$90.68
Materials						
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$111.33	20	$2,226.60

Practice: E512C - Cropland conversion to grass for soil organic matter improvement

Scenario: #1 - Cropland conversion to grass for soil organic matter improvement

Scenario Description:

Conversion of cropped land to grass-based agriculture. Mixtures of perennial grasses, forbs, and/or legume species are established on cropland where annually-seeded cash crops have been grown.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 512 - Forage and Biomass Planting

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 512 - Forage and Biomass Planting

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $1,108.22

Scenario Cost/Unit: $11.08

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	2	$48.38
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	4	$444.84
Materials						
Introduced Perennial Grasses, Legumes and/or Forbs, Low Density	2747	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$30.75	20	$615.00

Practice: E512D - Forage plantings that help increase organic matter in depleted soils

Scenario: #1 - Forage plantings that help increase organic matter in depleted soils

Scenario Description:

Establishing adapted and/or compatible species, varieties, or cultivars of herbaceous species suitable for pasture, hay, or biomass production that can help improve soil quality of depleted sites through increase or conservation of the organic matter in the soil.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 512 - Forage and Biomass Planting

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 512 - Forage and Biomass Planting

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $1,167.18

Scenario Cost/Unit: $11.67

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$18.46	25	$461.50
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	2	$90.68
Materials						
Introduced Perennial Grasses, Legumes and/or Forbs, Low Density	2747	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$30.75	20	$615.00

Practice: E512E - Forage and biomass planting that produces feedstock for biofuels or energy production.

Scenario: #1 - Forage and biomass planting that produces feedstock for biofuels or energy production.

Scenario Description:

Conversion of cropped land to grass-based agriculture. Mixtures of perennial grasses, forbs, and/or legume species are established on cropland where annually-seeded cash crops have been grown.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 512 - Forage and Biomass Planting

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 512 - Forage and Biomass Planting

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $5,788.92

Scenario Cost/Unit: $57.89

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	2	$222.42
Materials						
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$111.33	50	$5,566.50

Practice: E512F - Establishing native grass or legumes in forage base to improve the plant community

Scenario: #1 - Establishing native grass or legumes in forage base to improve the plant community

Scenario Description:

Establishing adapted and/or compatible species, varieties, or cultivars of perennial, herbaceous species that can provide the structure and composition needed to enhance livestock and wildlife habitat, particularly when targeted forage supply and quality, cover, and shelter are not available in other pastures.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 512 - Forage and Biomass Planting

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 512 - Forage and Biomass Planting

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $1,920.71

Scenario Cost/Unit: $19.21

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	1	$111.21
Materials						
Native Perennial Grasses, Legumes and/or Forbs, Low Density	2753	A mix of native perennial grasses, legumes, and/or forbs, grasses typically greater than 50% of the mix, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Species typically easy to purchase. Includes material and shipping.	Acres	$180.95	10	$1,809.50

Practice: E512G - Native grasses or legumes in forage base

Scenario: #1 - Native grasses or legumes in forage base

Scenario Description:

Establishing adapted and/or compatible species, varieties, or cultivars of perennial, herbaceous species that can provide the structure and composition needed to enhance livestock and wildlife habitat, particularly when targeted forage supply and quality, cover, and shelter are not available in other pastures.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 512 - Forage and Biomass Planting

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 512 - Forage and Biomass Planting

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $2,873.93

Scenario Cost/Unit: $28.74

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	2	$90.68
Materials						
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$111.33	25	$2,783.25

Practice: E512H - Forage plantings that enhance bird habitat cover and shelter or structure and composition

Scenario: #1 - Forage plantings that enhance bird habitat cover and shelter or structure and composition

Scenario Description:

Establishing adapted and/or compatible species, varieties, or cultivars of herbaceous species suitable for pasture, hay, or biomass production that can provide cover and shelter or structure and composition to bird habitat.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 512 - Forage and Biomass Planting

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 512 - Forage and Biomass Planting

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $2,653.24

Scenario Cost/Unit: $26.53

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	2	$68.24
Materials						
Native Perennial Grasses, Legumes and/or Forbs, Medium Density	2754	A mix of native perennial grasses, legumes, and/or forbs, grasses typically greater than 50% of the mix, mmay include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to higher density (41-60 pure live seeds/sq ft). Species typically easy to purchase. Includes material and shipping.	Acres	$258.50	10	$2,585.00

Practice: E512I - Establish pollinator and/or beneficial insect and/or monarch habitat

Scenario: #1 - Establish pollinator and/or beneficial insect and/or monarch habitat

Scenario Description:

Establishing adapted and/or compatible species, varieties, or cultivars of herbaceous species that can provide nectar for Monarch butterflies and/or pollinators and forage and other habitat values for wildlife and livestock, particularly at times when targeted nectar, forage supply and quality, cover, and shelter are not available in other pastures.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 512 - Forage and Biomass Planting

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 512 - Forage and Biomass Planting

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $2,807.42

Scenario Cost/Unit: $28.07

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	2	$222.42
Materials						
Native Perennial Grasses, Legumes and/or Forbs, Medium Density	2754	A mix of native perennial grasses, legumes, and/or forbs, grasses typically greater than 50% of the mix, mmay include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to higher density (41-60 pure live seeds/sq ft). Species typically easy to purchase. Includes material and shipping.	Acres	$258.50	10	$2,585.00

Practice: E512J - Establish wildlife corridors to provide habitat continuity or access to water

Scenario: #1 - Establish wildlife corridors to provide habitat continuity or access to water

Scenario Description:

Establishing adapted and/or compatible species, varieties, or cultivars of perennial, herbaceous species that can provide cover needed for wildlife species of concern to move from food/cover/water sources to other food/cover/water sources as needed for their life cycles, and/or to enhance the utility of underused wildlife habitat areas.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 512 - Forage and Biomass Planting

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 512 - Forage and Biomass Planting

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $1,665.48

Scenario Cost/Unit: $16.65

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$18.46	25	$461.50
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	2	$90.68
Materials						
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$111.33	10	$1,113.30

Practice: E528A - Maintaining quantity and quality of forage for animal health and productivity

Scenario: #1 - Maintaining quantity and quality of forage for animal health and productivity

Scenario Description:

Managing the harvest of vegetation with grazing and/or browsing animals for the purposes of maintaining desired pasture composition/plant vigor and improving/maintaining quantity and quality of forage for the animals' health and productivity following the recommendations of a qualifying professional, as detailed in the documentation and implementation requirements.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 528 - Prescribed Grazing

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 528 - Prescribed Grazing

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 1,000.0

Scenario Total Cost: $3,866.48

Scenario Cost/Unit: $3.87

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$109.25	1	$109.25
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	4	$89.16
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$19.49	12	$233.88
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$18.46	36	$664.56
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	17	$411.23
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	2	$90.68
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	12	$1,334.52
Materials						
Wire, Polywire	8	Wire, Polywire for electric fence - 1,300 ft. Includes materials and shipping only.	Each	$51.47	1	$51.47
Electric, Energizer, Solar	27	Electric, Energizer, Solar for electric fence. Includes materials and shipping only.	Each	$330.35	1	$330.35
Tank, Polyethylene, 300 gallon	291	Portable heavy duty rubber stock tank.	Each	$274.42	1	$274.42
Nutritional Balance Analyzer, fecal sample analysis only	1127	NIRS fecal analysis, animal performance report. Includes materials and shipping only.	Each	$46.16	6	$276.96

Practice: E528C - Incorporating wildlife refuge areas in contingency plans for wildlife.

Scenario: #1 - Incorporating wildlife refuge areas in contingency plans for wildlife.

Scenario Description:

A prescribed grazing plan that includes 12 month (or longer) rest (non-grazing period equal or greater than one year) of a grazing unit that consists of native grasses and/or legumes and/or perennial forbs for the purpose of meeting the needs for drought/disaster contingency plans that will also provide wildlife habitat or wildlife access to water for a period of time.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 528 - Prescribed Grazing

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 528 - Prescribed Grazing

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $1,642.52

Scenario Cost/Unit: $16.43

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$109.25	1	$109.25
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	2	$44.58
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$19.49	6	$116.94
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$18.46	15	$276.90
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	8	$193.52
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	2	$90.68
Materials						
Wire, Polywire	8	Wire, Polywire for electric fence - 1,300 ft. Includes materials and shipping only.	Each	$51.47	4	$205.88
Electric, Energizer, Solar	27	Electric, Energizer, Solar for electric fence. Includes materials and shipping only.	Each	$330.35	1	$330.35
Tank, Polyethylene, 300 gallon	291	Portable heavy duty rubber stock tank.	Each	$274.42	1	$274.42

Practice: E528D - Grazing management for improving quantity and quality of food or cover and shelter for wildlife

Scenario: #1 - Grazing management for improving quantity and quality of food or cover and shelter for wildlife

Scenario Description:

Grazing management employed will provide the plant structure, density and diversity needed for improving the quantity and quality of cover, shelter and food for the desired wildlife species of concern.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 528 - Prescribed Grazing

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 528 - Prescribed Grazing

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 1,000.0

Scenario Total Cost: $562.65

Scenario Cost/Unit: $0.56

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$109.25	1	$109.25
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	10	$453.40

Practice: E528E - Improved grazing management for enhanced plant structure and composition for wildlife

Scenario: #1 - Improved grazing management for enhanced plant structure and composition for wildlife

Scenario Description:
Managing the harvest of vegetation with grazing and/or browsing animals for the purpose of improving the quantity and quality of the structure and composition of the plant community that is available for wildlife.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 528 - Prescribed Grazing

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 528 - Prescribed Grazing

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $322.24

Scenario Cost/Unit: $3.22

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$18.46	15	$276.90
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	1	$45.34

Practice: E528F - Stockpiling cool season forage to improve structure and composition or plant productivity and health

Scenario: #1 - Stockpiling cool season forage to improve structure and composition or plant productivity and health

Scenario Description:
Grazing management employed to stop grazing events of selected paddock(s) to allow pasture forages to grow to maximum vegetative biomass accumulation before the end of the growing season.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 528 - Prescribed Grazing

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 528 - Prescribed Grazing

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $2,391.09

Scenario Cost/Unit: $23.91

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$109.25	1	$109.25
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	2	$44.58
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$19.49	6	$116.94
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$18.46	10	$184.60
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	8	$193.52
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	2	$90.68
Materials						
Wire, Polywire	8	Wire, Polywire for electric fence - 1,300 ft. Includes materials and shipping only.	Each	$51.47	1	$51.47
Electric, Energizer, Solar	27	Electric, Energizer, Solar for electric fence. Includes materials and shipping only.	Each	$330.35	1	$330.35
Nitrogen (N), Urea	71	Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.48	2000	$960.00
Tank, Polyethylene, 300 gallon	291	Portable heavy duty rubber stock tank.	Each	$274.42	1	$274.42
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$11.76	3	$35.28

Practice: E528G - Improved grazing management on pasture for plant productivity and health with monitoring activities

Scenario: #1 - Improved grazing management on pasture for plant productivity and health with monitoring activities

Scenario Description:

Managing the harvest of vegetation with grazing and/or browsing animals as adjusted when following recommendations of a qualifying professional, as detailed in the enhancement criteria, generated through pasture condition scoring (PCS).

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 528 - Prescribed Grazing

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 528 - Prescribed Grazing

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $1,010.40

Scenario Cost/Unit: $10.10

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$18.46	30	$553.80
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	4	$444.84
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$11.76	1	$11.76

Practice: E528I - Grazing management that protects sensitive areas -surface or ground water from nutrients

Scenario: #1 - Grazing management that protects sensitive areas -surface or ground water from nutrients

Scenario Description:

Grazing management employed will provide cover and density needed in the watershed in order to protect sensitive areas such as sinkholes, streams, highly erodible areas, or locations with plants that cannot tolerate defoliation.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 528 - Prescribed Grazing

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 528 - Prescribed Grazing

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 1,000.0

Scenario Total Cost: $1,734.33

Scenario Cost/Unit: $1.73

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$109.25	1	$109.25
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	4	$89.16
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$19.49	12	$233.88
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	17	$411.23
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	2	$90.68
Materials						
Wire, Polytape	7	Wire, Polytape for electric fence. Rolls of 655' to 825'. Includes materials and shipping only.	Each	$48.84	4	$195.36
Electric, Energizer, Solar	27	Electric, Energizer, Solar for electric fence. Includes materials and shipping only.	Each	$330.35	1	$330.35
Tank, Polyethylene, 300 gallon	291	Portable heavy duty rubber stock tank.	Each	$274.42	1	$274.42

Practice: E528J - Prescribed grazing on pastureland that improves riparian and watershed function

Scenario: #1 - Prescribed grazing on pastureland that improves riparian and watershed function

Scenario Description:
Grazing management employed will provide cover and density needed in the watershed in order to reduce runoff, improve infiltration, provide for above ground water filtration and sustain applicable fish and wildlife species habitat.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 528 - Prescribed Grazing

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 528 - Prescribed Grazing

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $1,550.22

Scenario Cost/Unit: $15.50

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$109.25	1	$109.25
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	2	$44.58
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$19.49	6	$116.94
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$18.46	10	$184.60
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	8	$193.52
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	2	$90.68
Materials						
Wire, Polywire	8	Wire, Polywire for electric fence - 1,300 ft. Includes materials and shipping only.	Each	$51.47	4	$205.88
Electric, Energizer, Solar	27	Electric, Energizer, Solar for electric fence. Includes materials and shipping only.	Each	$330.35	1	$330.35
Tank, Polyethylene, 300 gallon	291	Portable heavy duty rubber stock tank.	Each	$274.42	1	$274.42

Practice: E528K - Improved grazing management for soil compaction on pasture through monitoring activities

Scenario: #1 - Improved grazing management for soil compaction on pasture through monitoring activities

Scenario Description:

Manage the harvest of vegetation with grazing and/or browsing animals as adjusted when following recommendations of a qualifying professional, as detailed in the enhancement criteria, generated through pasture condition scoring (PCS).

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 528 - Prescribed Grazing

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 528 - Prescribed Grazing

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $816.88

Scenario Cost/Unit: $8.17

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$18.46	10	$184.60
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	4	$96.76
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	2	$90.68
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	4	$444.84

Practice: E528L - Prescribed grazing that improves or maintains riparian and watershed function-erosion

Scenario: #1 - Prescribed grazing that improves or maintains riparian and watershed function-erosion

Scenario Description:

Grazing management employed will provide cover and density needed in the watershed in order to reduce runoff, improve infiltration, provide for above ground water filtration and sustain applicable fish and wildlife species habitat.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 528 - Prescribed Grazing

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 528 - Prescribed Grazing

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $1,008.25

Scenario Cost/Unit: $10.08

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$109.25	1	$109.25
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$18.46	10	$184.60
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	10	$241.90
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	2	$90.68
Materials						
Wire, Polywire	8	Wire, Polywire for electric fence - 1,300 ft. Includes materials and shipping only.	Each	$51.47	1	$51.47
Electric, Energizer, Solar	27	Electric, Energizer, Solar for electric fence. Includes materials and shipping only.	Each	$330.35	1	$330.35

Practice: E528M - Grazing management that protects sensitive areas from gully erosion

Scenario: #1 - Grazing management that protects sensitive areas from gully erosion

Scenario Description:
Grazing management employed will provide vegetative cover and density needed in the watershed in order to protect sensitive areas such as sinkholes, streams, highly erodible areas, or locations that cannot tolerate plant defoliation.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 528 - Prescribed Grazing

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 528 - Prescribed Grazing

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 1,000.0

Scenario Total Cost: $1,587.81

Scenario Cost/Unit: $1.59

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$109.25	1	$109.25
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	4	$89.16
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$19.49	12	$233.88
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	17	$411.23
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	2	$90.68
Materials						
Wire, Polytape	7	Wire, Polytape for electric fence. Rolls of 655' to 825'. Includes materials and shipping only.	Each	$48.84	1	$48.84
Electric, Energizer, Solar	27	Electric, Energizer, Solar for electric fence. Includes materials and shipping only.	Each	$330.35	1	$330.35
Tank, Polyethylene, 300 gallon	291	Portable heavy duty rubber stock tank.	Each	$274.42	1	$274.42

Practice: E528N - Improved grazing management through monitoring activities

Scenario: #1 - Improved grazing management through monitoring activities

Scenario Description:

Three predominant key grazing areas are evaluated utilizing the Rangeland Health Assessment (where reference material is developed) or Describing Indicators of Rangeland Health protocols (where reference material is not developed) to determine how well the ecological processes of the site(s) are functioning. Utilizing knowledge learned from this as a part of the ranch resource assessment, a qualifying professional, as detailed in the enhancement criteria, will provide recommendations or follow-up evaluations toward mitigating some of the degradation risks that are initially identified.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 528 - Prescribed Grazing

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 528 - Prescribed Grazing

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 1,000.0

Scenario Total Cost: $2,022.95

Scenario Cost/Unit: $2.02

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$109.25	1	$109.25
Equipment Installation						
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$19.49	8	$155.92
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	10	$241.90
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	4	$181.36
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	12	$1,334.52

Practice: E528Q - Use of body condition scoring for livestock on a monthly basis to keep track of herd health

Scenario: #12 - Use of body condition scoring for livestock on a monthly basis to keep track of herd health

Scenario Description:

Body condition scoring (BCS) serves as a useful management tool to monitor livestock performance with respect to current and recent feeding or grazing programs. Body condition scoring is a numeric scoring system, producers can use to consistently evaluate animals' estimated body energy reserves through degree of fatness. This information can be used to adjust nutritional strategies to reach optimal BCS. Since body condition is closely associated with reproductive performance as well as feed efficiency, monitoring body condition can help producers reach production goals and increase the operation's bottom line. Knowledge and understanding of BCS will assist producers to adjust a supplemental feeding program to maintain animal health and nutrition on a-monthly-basis.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard 528 - Prescribed Grazing

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard 528 - Prescribed Grazing

Feature Measure: Acres

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $177.39

Scenario Cost/Unit: $1.77

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$109.25	1	$109.25
Equipment Installation						
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$19.49	1	$19.49
Rangeland/grassland field monitoring kit	967	Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only.	Each	$48.65	1	$48.65

Practice: E528R - Management Intensive Rotational Grazing

Scenario: #12 - Management Intensive Rotational Grazing

Scenario Description:
Management intensive, multi-paddock grazing system where livestock are regularly and systematically moved to fresh forage to optimize quantity and quality of forage growth, improve manure distribution, improve wildlife cover, and improve soil health.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard 528 - Prescribed Grazing

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard 528 - Prescribed Grazing

Feature Measure: Acres

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $3,726.19

Scenario Cost/Unit: $37.26

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$109.25	1	$109.25
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	2	$44.58
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$19.49	10	$194.90
Rangeland/grassland field monitoring kit	967	Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only.	Each	$48.65	1	$48.65
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	15	$362.85
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	2	$90.68
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	6	$667.26
Materials						
Wire, Polywire	8	Wire, Polywire for electric fence - 1,300 ft. Includes materials and shipping only.	Each	$51.47	2	$102.94
Electric, Ground Rods	20	Electric, Ground Rod for electric fence. Includes materials and shipping only.	Each	$10.95	3	$32.85
Electric, Ground Rod Clamps	21	Electric, Ground Rod Clamps for electric fence. Includes materials and shipping only.	Each	$2.16	3	$6.48
Electric, Tester	26	Electric, Tester for electric fence. Includes materials and shipping only.	Each	$46.56	1	$46.56
Electric, Energizer, Solar	27	Electric, Energizer, Solar for electric fence. Includes materials and shipping only.	Each	$330.35	1	$330.35
Tank, Polyethylene, 300 gallon	291	Portable heavy duty rubber stock tank.	Each	$274.42	2	$548.84
Pipe, PE, 1 1/4 in., DR 9	998	Materials: - 1 1/4 inch - PE - 160 psi - ASTM D3035 DR 9	Feet	$1.14	1000	$1,140.00

Practice: E533A - Advanced Pumping Plant Automation

Scenario: #12 - Advanced Pumping Plant Automation

Scenario Description:

This enhancement consists of installing a control device to a pump station that allows the user to remotely monitor and operate the pump station based on field measured data. Pumping stations may have either a combustible or electric power unit that are compatible with the control device or sensor. These devices/sensors collect field-measured data and provide this data in real time to the landowner to make irrigation decisions and adjustments to the pump operation.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard 533 - Pumping Plant.

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard 533 - Pumping Plant.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.0

Scenario Total Cost: $5,241.57

Scenario Cost/Unit: $5,241.57

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	4	$89.16
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	4	$136.48
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	4	$96.76
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	4	$444.84
Materials						
Solar Panels, fixed cost portion	1031	Fixed cost portion of the Solar Panels. This portion is a base cost for all Solar Panels and is not dependant on KiloWatt. The total cost of any Solar Panels will include this fixed cost plus a variable cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drops and etc). This cost will include material, labor and equipment.	Each	$273.31	1	$273.31
Solar Panels, variable cost portion	1135	Variable cost portion of the Solar Panels. This portion IS dependent on the total Kilowatt for the Solar Panels. The total cost of any Solar Panels will include this variable cost plus the fixed cost portion. The completed Solar Panels will include all materials (electrical, controllers, and service drop, etc). This cost will include material, labor and equipment.	Kilowatt	$2,429.59	0.1	$242.96
Switches and Controls, temp sensors	1192	Temperature and soil moisture sensors installed as part of an electronic monitoring (with or without wireless telecommunications) commonly used to control pumps and irrigation systems	Each	$579.54	1	$579.54
Switches and Controls, programmable controller	1193	Programmable logic controller (with or without wireless telecommunications) commonly used to control pumps and irrigation systems	Each	$307.65	1	$307.65
Switches and Controls, Wi-Fi system and software	1194	Software with built-in cellular or Wi-Fi communication commonly used to control pumps and irrigation systems	Each	$786.78	1	$786.78
Switches and Controls, radio system	1195	Output radio, field transmitter, and receiver commonly used to control pumps and irrigation systems	Each	$461.69	1	$461.69
Data Logger with Telemetry System	1454	Data Logger W/Graphic Output for water management and telemetry - data communication device with power supply in a weather proof enclosure. Equipment only.	Each	$1,577.29	1	$1,577.29
Safety Camera on Automated Pump	2474	Waterproof outdoor wireless IP Network security camera with housing. Includes materials only.	Each	$212.21	1	$212.21
Engine/Fuel Tank Sensor	2487	Transducer and sensors to monitor the oil pressure, oil and water temperatures, fuel flow meter with digital pulse output and fuel levels in a tank. Includes the conduit and cabling.	Each	$32.90	1	$32.90

Practice: E533B - Complete pumping plant evaluation for energy savings

Scenario: #1 - Complete pumping plant evaluation for energy savings

Scenario Description:

Evaluation of all pumping plants to determine the potential to rehabilitate/replace/reconfigure pump performance to improve water delivery efficiency 10% or more. Evaluate to determine if a Variable Frequency Drive motor controller(s) is recommended and the simple payback in terms of energy savings is less than 10 years.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 449 - Irrigation Water Management

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 449 - Irrigation Water Management

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 640.0

Scenario Total Cost: $3,896.77

Scenario Cost/Unit: $6.09

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	8	$272.96
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	32	$3,558.72
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	1	$65.09

Practice: E550A - Range planting for increasing/maintaining organic matter

Scenario: #1 - Range planting for increasing/maintaining organic matter

Scenario Description:
Establishment of adapted perennial or self-sustaining vegetation such as grasses, forbs, legumes, shrubs and trees for the purpose of increasing or maintaining organic matter levels in the soil.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 550 - Range Planting

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 550 - Range Planting

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $4,245.08

Scenario Cost/Unit: $42.45

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$18.46	15	$276.90
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	2	$90.68
Materials						
Native Perennial Grasses, Legumes and/or Forbs, Medium Density	2754	A mix of native perennial grasses, legumes, and/or forbs, grasses typically greater than 50% of the mix, mmay include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to higher density (41-60 pure live seeds/sq ft). Species typically easy to purchase. Includes material and shipping.	Acres	$258.50	15	$3,877.50

Practice: E550B - Range planting for improving forage, browse, or cover for wildlife

Scenario: #1 - Range planting for improving forage, browse, or cover for wildlife

Scenario Description:

Establishment of adapted perennial or self-sustaining vegetation such as grasses, forbs, legumes, shrubs and trees for the purpose of improving forage, browse, or cover for wildlife on areas that have been degraded beyond recovery via ecological principles, or old crop fields and pastures devoid of desirable, native rangeland species that fit within an ecological site description steady state.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 550 - Range Planting

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 550 - Range Planting

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $2,031.92

Scenario Cost/Unit: $20.32

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	2	$222.42
Materials						
Native Perennial Grasses, Legumes and/or Forbs, Low Density	2753	A mix of native perennial grasses, legumes, and/or forbs, grasses typically greater than 50% of the mix, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Species typically easy to purchase. Includes material and shipping.	Acres	$180.95	10	$1,809.50

Practice: E578A - Stream crossing elimination

Scenario: #1 - Stream crossing elimination

Scenario Description:
Existing stream crossings on an operation are consolidated into fewer crossings in order to reduce impacts to stream habitat.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 578 - Stream Crossing

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 578 - Stream Crossing

Feature Measure: Typical feature is 0.09 acres

Scenario Unit: Each

Scenario Typical Size: 1.0

Scenario Total Cost: $7,223.78

Scenario Cost/Unit: $7,223.78

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$50.89	16	$814.24
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$100.83	8	$806.64
Seeding Operation, Broadcast, Ground	959	Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs.	Acres	$11.06	0.1	$1.11
Truck, dump, 12 CY	1215	Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only.	Hours	$72.63	16	$1,162.08
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	32	$774.08
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	32	$846.72
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	16	$725.44
Materials						
Erosion Control Blanket, biodegradable	1213	Biodegradable erosion control blanket, typically a composite of natural fibers with reinforcing polymer netting. Materials and shipping only.	Square Yard	$1.32	300	$396.00
Tree & Shrub, Woody, Cuttings, Medium	1308	Woody cuttings, live stakes or whips typically 1/4 to 1 inch diameter and 24 to 48 inches long. Includes materials and shipping only.	Each	$0.89	300	$267.00
Aggregate, river rock	1834	Well graded, rounded mineral substrates derived from local riverine settings. Includes materials and local delivery	Ton	$24.49	42	$1,028.58
Annual Grasses	2730	Annual grasses, one or more species, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$32.58	0.1	$3.26
Introduced Perennial Grasses, Legumes and/or Forbs, Medium Density	2748	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to higher density (41-60 pure live seeds/sq ft). Includes material and shipping.	Acres	$43.92	0.1	$4.39
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: E580A - Stream corridor bank stability improvement

Scenario: #1 - Stream corridor bank stability improvement

Scenario Description:
Stream corridor bank vegetation components are established to provide additional streambank stability.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 580 - Streambank and Shoreline Protection

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 580 - Streambank and Shoreline Protection

Feature Measure: Area planted

Scenario Unit: Acres

Scenario Typical Size: 2.0

Scenario Total Cost: $4,126.89

Scenario Cost/Unit: $2,063.45

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	8	$178.32
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$19.49	8	$155.92
Trailer, enclosed, small	1503	Small enclosed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included.	Hours	$10.75	8	$86.00
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$11.47	8	$91.76
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	48	$1,161.12
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	8	$362.72
Materials						
Shrub, Potted, Small	1524	Potted shrub seedling, 1 quart to 1 gallon. Includes materials and shipping only.	Each	$6.41	65	$416.65
Tree, Hardwood, Potted, Small	1529	Potted hardwood seedling, 1 quart to 1 gallon. Includes materials and shipping only.	Each	$7.78	65	$505.70
Tree, Conifer, Potted, Small	1534	Potted conifer seedling, 1 quart to 1 gallon. Includes materials and shipping only.	Each	$5.71	65	$371.15
Tree shelter, mesh tree tube, 48 in.	1556	48 inch tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only.	Each	$1.02	65	$66.30
Tree shelter, solid tube type, 4 in. x 24 in.	1563	4 inch x 24 inch tree tube for protection from animal damage. Materials only.	Each	$2.05	65	$133.25
Tree shelter, solid tube type, 4 in. x 48 in.	1566	4 inch x 48 inch tree tube for protection from animal damage. Materials only.	Each	$4.22	65	$274.30
Stakes, wood, 1 in. x 1 in. x 48 in.	1578	1 in. x 1 in. x 48 in. wood stakes to fasten items in place. Includes materials only.	Each	$1.66	195	$323.70

Practice: E580B - Stream corridor bank vegetation improvement

Scenario: #1 - Stream corridor bank vegetation improvement

Scenario Description:
Stream corridor bank vegetation components are established to improve ecosystem functioning and stability.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 580 - Streambank and Shoreline Protection

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 580 - Streambank and Shoreline Protection

Feature Measure: Area planted

Scenario Unit: Acres

Scenario Typical Size: 2.0

Scenario Total Cost: $4,126.89

Scenario Cost/Unit: $2,063.45

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	8	$178.32
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$19.49	8	$155.92
Trailer, enclosed, small	1503	Small enclosed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included.	Hours	$10.75	8	$86.00
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$11.47	8	$91.76
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	48	$1,161.12
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	8	$362.72
Materials						
Shrub, Potted, Small	1524	Potted shrub seedling, 1 quart to 1 gallon. Includes materials and shipping only.	Each	$6.41	65	$416.65
Tree, Hardwood, Potted, Small	1529	Potted hardwood seedling, 1 quart to 1 gallon. Includes materials and shipping only.	Each	$7.78	65	$505.70
Tree, Conifer, Potted, Small	1534	Potted conifer seedling, 1 quart to 1 gallon. Includes materials and shipping only.	Each	$5.71	65	$371.15
Tree shelter, mesh tree tube, 48 in.	1556	48 inch tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only.	Each	$1.02	65	$66.30
Tree shelter, solid tube type, 4 in. x 24 in.	1563	4 inch x 24 inch tree tube for protection from animal damage. Materials only.	Each	$2.05	65	$133.25
Tree shelter, solid tube type, 4 in. x 48 in.	1566	4 inch x 48 inch tree tube for protection from animal damage. Materials only.	Each	$4.22	65	$274.30
Stakes, wood, 1 in. x 1 in. x 48 in.	1578	1 in. x 1 in. x 48 in. wood stakes to fasten items in place. Includes materials only.	Each	$1.66	195	$323.70

Practice: E590A - Improving nutrient uptake efficiency and reducing risk of nutrient losses

Scenario: #1 - Improving nutrient uptake efficiency and reducing risk of nutrient losses

Scenario Description:

Nutrient management encompasses managing the amount, source, placement, and timing of the application of plant nutrients and soil amendments. Nutrients are currently being applied on the farm based on the 4R nutrient stewardship principles. Enhanced nutrient use efficiency strategies or technologies are utilized to improve nutrient use efficiency and reduce risk of nutrient losses to surface and groundwater and reduce risks to air quality by reducing emissions of greenhouse gases (GHGs).

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 590 - Nutrient Management

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 590 - Nutrient Management

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $2,683.17

Scenario Cost/Unit: $26.83

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	2	$222.42
Materials						
Nitrogen-Urease inhibitor	260	Nitrogen-Urease inhibitor	Acres	$24.14	100	$2,414.00
Test, Soil Nitrogen Testing	311	Pre-Side Dress/Deep Soil Testing. Includes materials and shipping only.	Each	$9.35	5	$46.75

Practice: E590B - Reduce risks of nutrient loss to surface water by utilizing precision agriculture technologies

Scenario: #1 - Reduce risks of nutrient loss to surface water by utilizing precision agriculture technologies

Scenario Description:
Precision application technology and techniques are utilized to plan and apply nutrients to improve nutrient use efficiency and reduce risk of nutrient losses.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 590 - Nutrient Management

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 590 - Nutrient Management

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $1,406.02

Scenario Cost/Unit: $14.06

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Fertilizer, precision application	952	Fertilizer application performed by light bar/GPS navigation system. Includes equipment, power unit and labor costs.	Acres	$7.72	100	$772.00
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	2	$222.42
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$11.76	35	$411.60

Practice: E590C - Improving nutrient uptake efficiency and reducing risk of nutrient losses on pasture

Scenario: #12 - Improving nutrient uptake efficiency and reducing risk of nutrient losses on pasture

Scenario Description:

Nutrient management encompasses managing the amount, source, placement, and timing of the application of plant nutrients and soil amendments. Nutrients are currently being applied on the farm based on the 4R nutrient stewardship principles. Enhanced nutrient use efficiency strategies or technologies are utilized to improve nutrient use efficiency and reduce risk of nutrient losses on pasture.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard 590 - Nutrient Management

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard 590 - Nutrient Management

Feature Measure: Acres

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $1,687.24

Scenario Cost/Unit: $16.87

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Fertilizer, precision application	952	Fertilizer application performed by light bar/GPS navigation system. Includes equipment, power unit and labor costs.	Acres	$7.72	100	$772.00
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	4	$444.84
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$11.76	40	$470.40

Practice: E595A - Reduce risk of pesticides in surface water by utilizing precision pesticide application techniques

Scenario: #1 - Reduce risk of pesticides in surface water by utilizing precision pesticide application techniques

Scenario Description:

Utilize precision application techniques to reduce risk of pesticides in surface water by reducing total amount of chemical applied and reducing the potential for delivery of chemicals into water bodies.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 595 - Integrated Pest Management

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 595 - Integrated Pest Management

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $1,046.63

Scenario Cost/Unit: $10.47

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, precision application	949	Chemical application performed by light bar/GPS navigation system. Includes equipment, power unit and labor costs.	Acres	$7.13	100	$713.00
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	3	$333.63

Practice: E595B - Reduce risk of pesticides in water and air by utilizing IPM PAMS techniques

Scenario: #1 - Reduce risk of pesticides in water and air by utilizing IPM PAMS techniques

Scenario Description:

Utilize integrated pest management (IPM) prevent, avoidance, monitoring, and suppression (PAMS) techniques to reduce risk of pesticides in water and air. Reduce the potential for delivery of chemicals into water or ozone precursor emissions .

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 595 - Integrated Pest Management

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 595 - Integrated Pest Management

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.0

Scenario Total Cost: $674.83

Scenario Cost/Unit: $6.75

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	10	$341.20
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	3	$333.63

Practice: E595D - Increase the size requirement of refuges planted to slow pest resistance to Bt crops

Scenario: #1 - Increase the size requirement of refuges planted to slow pest resistance to Bt crops

Scenario Description:

Bacillus thuringiensis (Bt) plant incorporated protectants are plants that have been genetically altered to produce proteins that are harmful to certain insect pests. Widespread implementation of Bt crops has decreased insecticide use and increased crop yields, but it must be used as part of an integrated pest management (IPM) approach to protect the crop from pest species that are not susceptible to the Bt toxin and to manage pest resistance. Crop rotation, scouting and resistance management strategies, such as planting and creating refuges of non-Bt crops, are essential when farming Bt crops. Insects have developed resistance to Bt proteins. To mitigate the development of further resistance, growers are required to plant refuges of non-transgenic crops. These refuges produce numbers of susceptible insects that will help sustain populations of non-resistant insects. The size of Refuge requirement depends on the environment, pest and strain of the crop. Size of refuge is determined by resistance risk. Most Bt corn requires that 20% of the total Bt crop planted be non-Bt. Cotton can require 50% of the crop be planted to non-Bt. A recent study published in the Journal of Integrated Pest Management revealed, compliance has been a challenge. Nearly 40% of growers surveyed did not plant the required refuge (Reisig 2017). They credit non-compliance, in part, to lack of understanding by small-scale farmers about the need for refuges.

Before Situation:

Minimal or no refuges were planted as required for Bt crops.

After Situation:

Optimum sized and located refuges are planted for Bt crops.

Feature Measure: Ac

Scenario Unit: Acres

Scenario Typical Size: 40.0

Scenario Total Cost: $563.62

Scenario Cost/Unit: $14.09

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	10	$341.20
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	2	$222.42

Practice: E595E - Eliminate use of chemical treatments to control pests and to increase the presence of dung beetles

Scenario: #1 - Eliminate use of chemical treatments to control pests and to increase the presence of dung beetles

Scenario Description:

Pests and parasites can have a significant impact on the economic viability of livestock operations, by affecting the performance and health of animals. The use of broad-spectrum insecticides, pour-ons and avermectins have been shown to have a detrimental effect on dung beetle populations. Having a healthy population of dung beetles facilitates the recycling of nutrients and promotes soil and grassland health. By eliminating the application of broad-spectrum insecticides, pour-ons, and avermectins, including injectable avermectins, for pest control in and on livestock along with rotational grazing and higher stock densities has shown to increase the dung beetle population. Use of natural or alternative methods of pest control over multiple years is encouraged.

Before Situation:

Pests and parasites can have a significant impact on the economic viability of livestock operations, by affecting the performance and health of animals. The use of broad-spectrum insecticides, pour-ons and avermectins have been shown to have a detrimental

After Situation:

Having a healthy population of dung beetles facilitates the recycling of nutrients and promotes soil and grassland health. By eliminating the application of broad-spectrum insecticides, pour-ons, and avermectins, including injectable avermectins, for pest

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 500.0

Scenario Total Cost: $3,035.66

Scenario Cost/Unit: $6.07

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$109.25	1	$109.25
Equipment Installation						
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$19.49	26	$506.74
Rangeland/grassland field monitoring kit	967	Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only.	Each	$48.65	1	$48.65
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	10	$341.20
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	10	$241.90
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	10	$453.40
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	12	$1,334.52

Practice: E612A - Cropland conversion to trees or shrubs for long term improvement of water quality

Scenario: #1 - Cropland conversion to trees or shrubs for long term improvement of water quality

Scenario Description:

Cropland conversion to trees and shrubs for long term erosion control and improvement of water quality. Trees and shrubs are established on cropland where annually-seeded cash crops have been grown. Tree and/or shrub species are selected for their efficacy in holding soil, and the planting design is configured to control runoff and trap sediment.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 612 - Tree/Shrub Establishment

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 612 - Tree/Shrub Establishment

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 10.0

Scenario Total Cost: $2,797.68

Scenario Cost/Unit: $279.77

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$20.31	10	$203.10
Ripper or subsoiler, 16 to 36 inch depth	1235	Deep ripper or subsoiler, (16-36 inches depth) includes tillage implement, power unit and labor.	Acres	$19.09	10	$190.90
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$215.46	4	$861.84
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$248.06	4	$992.24
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acres	$121.05	2	$242.10
Materials						
Tropical species, Medium	1541	Tropical seedling, native or non-native, 1 quart to gallon pot, or containerized, 10 cubic inch. Includes materials and shipping only.	Each	$0.00	500	$0.00
Introduced Perennial Grasses, Legumes and/or Forbs, Low Density	2747	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$30.75	10	$307.50

Practice: E612B - Planting for high carbon sequestration rate

Scenario: #1 - Planting for high carbon sequestration rate

Scenario Description:

Plant tree species and use stocking levels for higher growth to increase the rate of carbon sequestration (capture). Use species with a longer life span as well as relatively fast growth, and species suitable for durable manufactured products. Increase stocking levels in forests that are not fully stocked. Implement afforestation on appropriate open lands.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 612 - Tree/Shrub Establishment

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 612 - Tree/Shrub Establishment

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 10.0

Scenario Total Cost: $12,170.72

Scenario Cost/Unit: $1,217.07

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	6	$133.74
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	4	$21.36
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$21.30	6	$127.80
Mechanical tree planter	1600	Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor.	Hours	$5.49	6	$32.94
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	6	$145.14
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	6	$158.76
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$45.34	6	$272.04
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$9.21	4	$36.84
Herbicide, Sulfometuron & metsulfuron	344	A residual sulfonylurea herbicide that kills broadleaf weeds and some annual grasses. It is a systemic compound with foliar and soil activity. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$10.96	4	$43.84
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$1.51	3	$4.53
Tree, Hardwood, Seedling, Medium	1510	Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only.	Each	$1.52	7260	$11,035.20
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53

Practice: E612C - Establishing tree/shrub species to restore native plant communities

Scenario: #1 - Establishing tree/shrub species to restore native plant communities

Scenario Description:

Establish trees and/or shrubs to restore elements of plant diversity that have been lost through past diseases or improper management. For example, disease-resistant varieties of elm and chestnut can be established to restore the ecological functions of American elm and American chestnut. At the stand level, past forest management may have eliminated certain native tree species. Restoring stand-level diversity and function addresses a wide array of resource concerns and strengthens ongoing management activities. This enhancement improves a forest that is already in good condition by increasing plant diversity, and improving health and vigor through adding plants with resistance to disease, pests, or other local hazards. Additional benefits include contributing to carbon storage, and providing diversity in wildlife habitat and food sources.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 612 - Tree/Shrub Establishment

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 612 - Tree/Shrub Establishment

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 5.0

Scenario Total Cost: $4,712.84

Scenario Cost/Unit: $942.57

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	2	$44.58
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$11.47	12	$137.64
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	12	$290.28
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	4	$444.84
Materials						
Shrub, Potted, Small	1524	Potted shrub seedling, 1 quart to 1 gallon. Includes materials and shipping only.	Each	$6.41	50	$320.50
Tree, Hardwood, Potted, Medium	1532	Potted hardwood seedling, 2 gallons or larger. Includes materials and shipping only.	Each	$14.60	100	$1,460.00
Tree, Conifer, Potted, Medium	1537	Potted conifer seedling, 2 gallons or larger. Includes materials and shipping only.	Each	$13.76	100	$1,376.00
Tree shelter, solid tube type, 4 in. x 60 in.	1567	4 inch x 60 inch tree tube for protection from animal damage. Materials only.	Each	$4.26	150	$639.00

Practice: E612D - Adding food-producing trees and shrubs to existing plantings

Scenario: #1 - Adding food-producing trees and shrubs to existing plantings

Scenario Description:
Plant food-producing trees and shrubs for wildlife or human consumption within windbreaks, alley cropping, multi-story cropping, silvopasture systems, and/or riparian forest buffers.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 612 - Tree/Shrub Establishment

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 612 - Tree/Shrub Establishment

Feature Measure: Acres

Scenario Unit: Acres

Scenario Typical Size: 10.0

Scenario Total Cost: $1,984.72

Scenario Cost/Unit: $198.47

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	2	$44.58
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	1	$5.34
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$19.49	10	$194.90
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$11.47	10	$114.70
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$215.46	0.41	$88.34
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$248.06	0.36	$89.30
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acres	$121.05	0.23	$27.84
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	10	$241.90
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$9.21	1	$9.21
Herbicide, Sulfometuron & metsulfuron	344	A residual sulfonylurea herbicide that kills broadleaf weeds and some annual grasses. It is a systemic compound with foliar and soil activity. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$10.96	1	$10.96
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$1.51	1	$1.51
Shrub, Seedling, Medium	1507	Bare root shrub seedling, 18 to 36 inches tall; includes tropical containerized seedlings 10 to 20 cubic inches. Includes materials and shipping only.	Each	$1.41	341	$480.81
Tree, Hardwood, Seedling, Medium	1510	Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only.	Each	$1.52	340	$516.80
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53

Practice: E612E - Cultural plantings

Scenario: #1 - Cultural plantings

Scenario Description:
Plant trees and shrubs that are of cultural significance, such as those species utilized by Tribes in traditional practices, medicinal plants, species used in basket-making, etc. (e.g., paper birch, slippery elm, witch hazel).

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 612 - Tree/Shrub Establishment

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 612 - Tree/Shrub Establishment

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 1.0

Scenario Total Cost: $1,827.33

Scenario Cost/Unit: $1,827.33

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	2	$44.58
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	1	$5.34
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$11.47	10	$114.70
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$215.46	0.41	$88.34
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$248.06	0.36	$89.30
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acres	$121.05	0.23	$27.84
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	10	$241.90
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$9.21	1	$9.21
Herbicide, Sulfometuron & metsulfuron	344	A residual sulfonylurea herbicide that kills broadleaf weeds and some annual grasses. It is a systemic compound with foliar and soil activity. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$10.96	1	$10.96
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$1.51	1	$1.51
Tree, Hardwood, Seedling, Medium	1510	Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only.	Each	$1.52	681	$1,035.12
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53

Practice: E612G - Tree/shrub planting for wildlife food

Scenario: #1 - Tree/shrub planting for wildlife food

Scenario Description:

Tree or shrub planting to enhance habitat for native wildlife. A minimum of five tree or shrub species will be used; they will be species that provide food and/or cover for identified wildlife species.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 612 - Tree/Shrub Establishment

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 612 - Tree/Shrub Establishment

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 1.0

Scenario Total Cost: $1,853.75

Scenario Cost/Unit: $1,853.75

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	2	$44.58
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$5.34	1	$5.34
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$11.47	11	$126.17
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$215.46	0.41	$88.34
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$248.06	0.36	$89.30
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acres	$121.05	0.23	$27.84
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	11	$266.09
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$9.21	1	$9.21
Herbicide, Sulfometuron & metsulfuron	344	A residual sulfonylurea herbicide that kills broadleaf weeds and some annual grasses. It is a systemic compound with foliar and soil activity. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$10.96	1	$10.96
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$1.51	1	$1.51
Shrub, Seedling, Medium	1507	Bare root shrub seedling, 18 to 36 inches tall; includes tropical containerized seedlings 10 to 20 cubic inches. Includes materials and shipping only.	Each	$1.41	605	$853.05
Tree, Hardwood, Seedling, Medium	1510	Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only.	Each	$1.52	218	$331.36

Practice: E644A - Managing Flood-Irrigated Landscapes for Wildlife

Scenario: #1 - Managing Flood-Irrigated Landscapes for Wildlife

Scenario Description:

Developing and implementing a conservation plan that supports maintenance of flood-irrigation in key landscapes to provide important foraging habitat for local breeding and migratory waterfowl and waterbirds.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 644 – Wetland Wildlife Habitat Management

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 644 – Wetland Wildlife Habitat Management

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 50.0

Scenario Total Cost: $1,288.84

Scenario Cost/Unit: $25.78

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	9	$200.61
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	22	$532.18
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	5	$556.05

Practice: E645A - Reduction of attractants to human-subsidized predators in sensitive wildlife species habitat

Scenario: #1 - Reduction of attractants to human-subsidized predators in sensitive wildlife species habitat

Scenario Description:

Reduction of artificial perching sites, nest sites, food, and water available to subsidized predators in areas where human-subsidized predators are a threat to sensitive wildlife species. Human-subsidized predators may include ravens, crows, magpies, coyotes, foxes, skunks, raccoons, and other species. Activities under this enhancement may include removal of non- native or invasive trees; removal of unused power poles, corrals, windmills, buildings, and other vertical structures; and/or removal or management of watering facilities, dead livestock, road kill, garbage, animal feed, dumps, and other non-natural food sources.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 645 - Upland Wildlife Habitat Management

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 645 - Upland Wildlife Habitat Management

Feature Measure: Acre

Scenario Unit: Number

Scenario Typical Size: 40.0

Scenario Total Cost: $1,954.08

Scenario Cost/Unit: $48.85

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	24	$534.96
Trailer, enclosed, small	1503	Small enclosed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included.	Hours	$10.75	24	$258.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	48	$1,161.12

Practice: E645B - Manage existing shrub thickets to provide adequate shelter for wildlife

Scenario: #12 - Manage existing shrub thickets to provide adequate shelter for wildlife

Scenario Description:

Existing shrub thickets provide an instant and important cover for wildlife. Various wildlife species may use shrubs as winter/thermal cover, summer shade, roosting, or as escape cover from predators. Proper management ensures that these shrubs will continue to provide the desired benefits for the local wildlife. A combination of herbicide treatments, cutting and trimming branches, and removal of other competing vegetation will occur. An eligible existing shrub thicket needs to have a canopy cover of 750 square feet, with an end goal of expanding to 1500 square feet. Any existing shrub thicket (not hand planted within the last 5 years) are eligible for this enhancement. Shrub thickets found within fence rows may now be very wide, but still meet the 750 square feet, are eligible.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard 645 - Upland Wildlife Habitat Management

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard 645 - Upland Wildlife Habitat Management

Feature Measure: Acres

Scenario Unit: Acres

Scenario Typical Size: 1.0

Scenario Total Cost: $291.11

Scenario Cost/Unit: $291.11

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.59	2	$13.18
Pruning tools, hand tools	1318	Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included.	Hours	$2.13	2	$4.26
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	2	$68.24
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	4	$96.76
Materials						
Herbicide, Imazapyr	336	Pre and post-emergent, non-selective herbicide for control of undesirable vegetation in non-crop areas. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$42.07	1	$42.07
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$1.51	1	$1.51
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	1	$65.09

Practice: E645C - Edge feathering for wildlife cover

Scenario: #12 - Edge feathering for wildlife cover

Scenario Description:

Selected trees are cut and brush clipped along the border between a wooded area and a grassland, cropland, or idle land, creating a dense woody cover of interlocking branches at ground level. The feathered edge will be an average of 30 feet wide and a minimum of 50 feet long, resulting in an area of 1500 square feet. The width of the strip will vary to follow topographic features and to create a wavy border; the design will also consider aesthetics. Vegetative composition and cover will vary within the edge, ranging from areas with no trees and shrubs to areas with scattered trees and extensive shrub cover. The variation in vegetation structure along with variable width of the edge will create feathering. The edge may include shrub plantings for wildlife food and aesthetics.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard 645 - Upland Wildlife Habitat Management

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard 645 - Upland Wildlife Habitat Management

Feature Measure: Acres

Scenario Unit: Acres

Scenario Typical Size: 1.0

Scenario Total Cost: $792.75

Scenario Cost/Unit: $792.75

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.59	8	$52.72
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hours	$66.08	2	$132.16
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	8	$272.96
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	8	$193.52
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	2	$48.38
Materials						
Herbicide, Triclopyor	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acres	$27.92	1	$27.92
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$65.09	1	$65.09

Practice: E647C - Maintain most soil vegetation on cropland edges to enhance waterfowl and shorebird habitat

Scenario: #1 - Maintain most soil vegetation on cropland edges to enhance waterfowl and shorebird habitat

Scenario Description:

The wetter or more water saturated portions of cropland fields such as areas adjacent to field drains, have the potential to produce a significant amount of moist soil plants which are a tremendously valuable source of forage and cover for many waterfowl, shorebird and wading bird species, especially during a period of time when such plants may be limited. Under normal cropland production, the native vegetation is restricted on these sites through mechanical and/or chemical control. These maintained moist soil plants also will provide filtering and improve water quality.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 647 - Early Successional Habitat Development and Management

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 647 - Early Successional Habitat Development and Management

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 50.0

Scenario Total Cost: $535.94

Scenario Cost/Unit: $10.72

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hours	$46.50	3	$139.50
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	3	$79.38
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	2	$317.06

Practice: E666A - Maintaining and improving forest soil quality

Scenario: #1 - Maintaining and improving forest soil quality

Scenario Description:

Adopts guidelines for maintaining and improving soil quality on sites where forest management activities are practiced. These guidelines will increase soil organic matter content, improve nutrient cycling, and increase infiltration and retention of precipitation. Avoiding soil compaction will allow for greater root development and tree growth, limit windthrow, and reduce drought stress. Increasing carbon storage on site will maintain the soil microbial community and provide wildlife benefits.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 50.0

Scenario Total Cost: $2,155.39

Scenario Cost/Unit: $43.11

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.59	4	$26.36
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	2	$44.58
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$19.49	4	$77.96
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	8	$193.52
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	13	$1,445.73
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$11.76	10	$117.60
Tree Marking Paint	313	Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only.	Acres	$8.78	5	$43.90
Certified Organic, Annual Grasses, Legumes and/or Forbs	2343	Annual grasses, mostly introduced but may be native. Used for temporary cover or cover crops. Certified organic. Includes material and shipping only.	Acres	$68.58	3	$205.74

Practice: E666D - Forest management to enhance understory vegetation

Scenario: #1 - Forest management to enhance understory vegetation

Scenario Description:

This enhancement provides for management of the understory vegetation in a forested area by mechanical, chemical, and/or manual methods to improve the plant species mix and the health of the residual vegetation. Managing the understory vegetation increases available water to the plants, minimizes runoff and erosion, and improves water quality. An adequately stocked forest provides inputs of leaves, needles, and woody twigs and stems to the forest floor, adding to soil organic matter and contributing to forest soil health. Desirable tree species and understory vegetation, with spacing that allows ground cover to develop, will allow moisture to infiltrate and be stored in the soil, releasing moisture over longer periods of time.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 20.0

Scenario Total Cost: $5,153.96

Scenario Cost/Unit: $257.70

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Mechanical cutter, chopper	943	Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included.	Hours	$90.63	16	$1,450.08
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hours	$66.08	16	$1,057.28
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	16	$423.36
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	11	$1,223.31
Materials						
Herbicide, Imazapyr	336	Pre and post-emergent, non-selective herbicide for control of undesirable vegetation in non-crop areas. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$42.07	20	$841.40
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53

Practice: E666E - Reduce height of the forest understory to limit wildfire risk

Scenario: #1 - Reduce height of the forest understory to limit wildfire risk

Scenario Description:

Forest stand improvement that manages forest structure to reduce the risk of wildfire, and creates conditions that facilitate prescribed burning. The fire risk reduction is accomplished by reducing the height of the woody understory and midstory, creating space between the ground cover and the tree canopy. This enhancement provides for management of the understory vegetation in a forested area, using mechanical, chemical or manual methods to improve the plant species mix and the health of the residual vegetation, and reduce the risk of wildfire. In appropriate stands, the treatment creates conditions that favor prescribed burning. Forest stand improvement (FSI) activities are used to remove trees of undesirable species, form, quality, condition, or growth rate. The quantity and quality of forest for wildlife and/or timber production will be increased by manipulating stand density and structure. These treatments can also reduce wildfire hazards, improve forest health, restore natural plant communities, and achieve or maintain a desired native understory plant community for soil health, wildlife, grazing, and/or browsing.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 20.0

Scenario Total Cost: $5,153.96

Scenario Cost/Unit: $257.70

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Mechanical cutter, chopper	943	Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included.	Hours	$90.63	16	$1,450.08
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hours	$66.08	16	$1,057.28
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	16	$423.36
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	11	$1,223.31
Materials						
Herbicide, Imazapyr	336	Pre and post-emergent, non-selective herbicide for control of undesirable vegetation in non-crop areas. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$42.07	20	$841.40
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53

Practice: E666F - Reduce forest stand density to create open stand structure

Scenario: #1 - Reduce forest stand density to create open stand structure

Scenario Description:

Reducing forest stand density creates open forest conditions with a low basal area which promotes the health and vigor of the residual trees. The open stand structure allows a significant amount of sunlight to reach the forest floor and stimulates the growth of understory vegetation. Understory vegetation management, along with the wide spacing between trees or clumps of trees, provides visual appeal, lowers the risk of wildfire, and provides habitat for many at-risk and listed wildlife species. The enhancement creates conditions that facilitate a follow-up treatment with prescribed burning.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 20.0

Scenario Total Cost: $5,886.64

Scenario Cost/Unit: $294.33

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Mechanical cutter, chopper	943	Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included.	Hours	$90.63	20	$1,812.60
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hours	$66.08	20	$1,321.60
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$26.46	20	$529.20
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	11	$1,223.31
Materials						
Herbicide, Imazapyr	336	Pre and post-emergent, non-selective herbicide for control of undesirable vegetation in non-crop areas. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$42.07	20	$841.40
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$158.53	1	$158.53

Practice: E666K - Creating structural diversity with patch openings

Scenario: #1 - Creating structural diversity with patch openings

Scenario Description:

Forest stand improvement that creates patch openings. Size, shape, and arrangement of patches will be based on natural features, and emulate patches that would result from natural disturbance regimes of wind or fire, varying geographically and by forest type, and by tree species desired from natural regeneration. The treatment will create diversity in stand composition and structure, increase pest resistance, and enhance wildlife food availability. Openings may provide regeneration sites and restore natural plant communities, and achieve or maintain a desired understory plant community for wildlife habitat.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 15.0

Scenario Total Cost: $8,287.65

Scenario Cost/Unit: $552.51

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.59	150	$988.50
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	15	$334.35
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	150	$3,628.50
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	30	$3,336.30

Practice: E666M - Maintaining structural diversity in dry Western forests

Scenario: #1 - Maintaining structural diversity in dry Western forests

Scenario Description:

This enhancement retains the beneficial effects of treatments that have been applied to restore ecological function in dry Western forests. It is implemented following a forest stand improvement treatment designed to restore variable and patchy conditions typical of benchmark ecological sites. After a restoration treatment, young trees often regenerate in numbers higher than desired, leading to increased fire risk and loss of wildlife habitat. The enhancement will address follow-up activities needed for maintaining forest structure. Site conditions will be monitored and follow-up treatments recommended as needed. The enhancement protects investments in habitat creation by providing for follow-up activities that require the expertise of a forester or wildlife biologist.

Before Situation:

A dry Western forest stand has an undesirable overabundance of tree regeneration that threatens to reverse previous restoration treatments and contribute to a buildup of fire fuels.

After Situation:

The forest stand has retained its patchy structure and open areas are dominated by grasses and forbs. Wildfire hazard has been reduced.

Feature Measure: Acres

Scenario Unit: Acres

Scenario Typical Size: 25.0

Scenario Total Cost: $6,768.09

Scenario Cost/Unit: $270.72

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	12	$267.48
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hours	$66.08	12	$792.96
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	50	$5,560.50
Materials						
Herbicide, Triclopyor	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acres	$27.92	5	$139.60
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$1.51	5	$7.55

Practice: E666N - Creating structural diversity in dry Western forests

Scenario: #1 - Creating structural diversity in dry Western forests

Scenario Description:

Restore natural stand structure in dry Western forests by creating openings characteristic of reference ecological site conditions in stands where even thinning treatments have already been applied to reduce wildfire risk. Thinning treatments are effective in reducing fuels, but typically do not restore forest structural diversity to emulate benchmark or reference conditions. Applying this enhancement as a follow-up treatment will create a patchy structure that provides open areas where grasses and forbs can thrive and produce wildlife food and cover. The size, shape, and arrangement of openings will be based on moisture availability and site physiography, to emulate structural conditions that would result from natural disturbance regimes of wind and/or fire.

Before Situation:

A dry Western forest stand has been evenly thinned for fire fuel reduction but lacks the historically patchy structure created by fire. Without grassy openings, there is a lack of wildlife food.

After Situation:

The restored forest stand has a patchy structure with open areas where grasses and forbs provide wildlife food and cover.

Feature Measure: Acres

Scenario Unit: Acres

Scenario Typical Size: 25.0

Scenario Total Cost: $26,239.09

Scenario Cost/Unit: $1,049.56

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.59	120	$790.80
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	30	$668.70
Mechanical cutter, chopper	943	Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included.	Hours	$90.63	60	$5,437.80
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	120	$4,094.40
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	240	$5,805.60
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$33.64	60	$2,018.40
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	64	$7,117.44
Materials						
Tree Marking Paint	313	Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only.	Acres	$8.78	8	$70.24
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$235.71	1	$235.71

Practice: E666O - Snags, den trees, and coarse woody debris for wildlife habitat

Scenario: #1 - Snags, den trees, and coarse woody debris for wildlife habitat

Scenario Description:
Improve wildlife habitat through creation and retention of snags, den trees, forest stand structural diversity, and coarse woody debris on the forest floor, to provide cover/shelter for native wildlife species.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 10.0

Scenario Total Cost: $523.67

Scenario Cost/Unit: $52.37

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.59	7	$46.13
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	1	$22.29
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hours	$66.08	3	$198.24
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	7	$238.84
Materials						
Herbicide, Picloram	337	Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$18.17	1	$18.17

Practice: E666P - Summer roosting habitat for native forest-dwelling bat species

Scenario: #1 - Summer roosting habitat for native forest-dwelling bat species

Scenario Description:
Create new potential roost trees within upland and riparian forests to achieve desired summer habitat for forest-dwelling bat species.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 10.0

Scenario Total Cost: $2,107.26

Scenario Cost/Unit: $210.73

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.59	13	$85.67
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	6	$133.74
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hours	$66.08	13	$859.04
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	13	$314.47
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	4	$444.84
Materials						
Tree Marking Paint	313	Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only.	Acres	$8.78	10	$87.80
Herbicide, Picloram	337	Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$18.17	10	$181.70

Practice: E666R - Forest songbird habitat maintenance

Scenario: #1 - Forest songbird habitat maintenance

Scenario Description:

Adopts guidelines and methods developed by the Forest Bird Initiative of the Vermont Audubon Society, to preserve habitat features following a forest stand improvement treatment designed to create habitat for a suite of forest-dwelling neotropical migratory songbirds. It includes developing or updating a forest management plan, inspecting and tending forest habitat, and monitoring bird populations. It protects investments in habitat creation by providing for follow-up activities that require the expertise of a professional forester or biologist. This enhancement is appropriate for states in the Atlantic Flyway and the Upper Midwest.

Before Situation:

The bird habitat of a forest stand is threatened by undesirable vegetation, including noxious and invasive plants, and tree regeneration of species not favorable to birds. Harmful insects and tree diseases may also be present, and storms may have damaged

After Situation:

The forest stand has retained its habitat features and is utilized by a diversity of neotropical migratory songbirds.

Feature Measure: Acres

Scenario Unit: Acres

Scenario Typical Size: 25.0

Scenario Total Cost: $5,108.08

Scenario Cost/Unit: $204.32

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.59	4	$26.36
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$22.29	10	$222.90
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hours	$66.08	4	$264.32
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$34.12	4	$136.48
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$24.19	4	$96.76
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.21	38	$4,225.98
Materials						
Tree Marking Paint	313	Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only.	Acres	$8.78	2	$17.56
Herbicide, Triclopyor	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acres	$27.92	4	$111.68
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$1.51	4	$6.04